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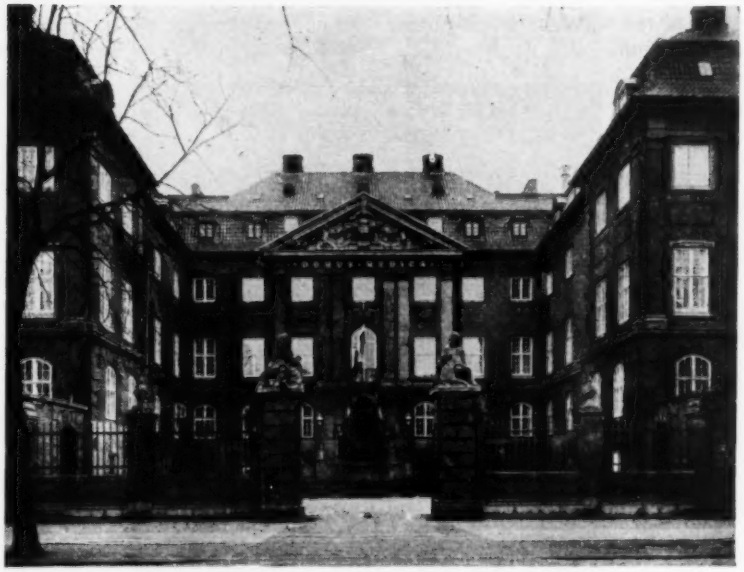
CENTENARY OF THE DANISH MEDICAL ASSOCIATION



On September the 1st, the Danish Medical Association celebrated its first centennial anniversary. *Den almindelige danske Lægeforening,* as the organisation is called in Danish, was founded at a meeting held in Korsør on September the 1st, 1857. Politically, the middle of the nineteenth century was influenced by the liberal Constitution given in 1848, and medically it was the time of the great plagues, a great cholera epidemic breaking out in Copenhagen four years before the foundation of the Association. The initiative was taken by Dr. Andreas Black, Physician to the Sorø Akademi, a well-known school for boys. Dr. Black motivated his proposal in *Ugeskrift for Læger,* then already in its nineteenth year of publication and a quarter of a century later to become the official journal of the Association.

Dr. Black recommended his colleagues "solidarity, perseverance and moderation". The Danish Medical Association, following this advice, has since kept together the Danish Medical Profession and slowly "gained influence upon everything pertaining to the science in the service of which physicians work, the conditions under which they work, and the means necessary thereto". To-day, in 1957, the Danish Medical Association comprises, with very few exceptions, every physician in the country, in all 6028 members divided into 23 regional branches, an organisation of the young doctors in hospital service, and a specialist organisation. To defend the rights, to preserve the interests and to guard the ethics of the Danish Medical Profession has always been and shall always remain the aim of the Danish Medical Association.

THE DEVELOPMENT OF MEDICINE IN DENMARK SINCE THE FOUNDATION OF THE UNIVERSITY OF COPENHAGEN IN 1479

By EDVARD GOTFREDSEN

In 1479 King Christian I founded with papal consent the University of Copenhagen which was planned as a *schola universalis* comprising four faculties, one for each of the following subjects: Divinity, Law, Medicine and Philosophy. The number of students was, however, only small, and it seems as if the medical instruction had not been started at all when, in 1530, the University was closed because of the state of unrest during the period of Reformation.

As far as Medicine was concerned, it was provided that two doctors should be appointed, a *medicus primus* and a *medicus alter*, who would not only have to teach at the faculty but also attend the sick at the Court and the University, in town and in the country, "for no large community can do without a doctor". They were to give lectures four days a week, two days on medicine and the other two days on mathematics and physics. The medical lectures were to be based on the teachings of the Arabs Avicenna and Razes, and of the classics Galen and Hippocrates. Physics was to be taught according to the principles af Aristotle, mathematics according to the systems of Euclid and Ptolemy. Further, the professors were to deliver an annual declamation praising the study of medicine, or dealing with some medical subject which might be expected to please the whole university. In addition, they would have to hold learned discussions four times a year, and, lastly, it was their duty each to write an almanac in alternate years.

Fig. 1.
The University of Copenhagen in the 17th century. The central building is the anatomical theatre. The Church of our Lady is seen in the background.

After the Reformation of the church had been carried through, the University was re-established by King Christian III in 1537. Its first head was *doctor medicinæ* Christiern Torchelsen Morsing, who in the same year published a lecture list with a number of rules for the activity of each faculty, and these fundamental rules were repeated and elaborated in the Charter of the University of 1539.

From the Medical-historical Museum, University of Copenhagen. Director: Professor *Edv. Gotfredsen*.

In this manner the new University followed the old scholastic lines. Medicine was a mere study of books, for the teaching only consisted in arid lectures and, though the head of the University had enjoined the doctors of medicine not to neglect anatomy, the University did not even possess a skeleton for demonstration of the bones.

The few Danes who wanted to study medicine were thus still under the necessity of taking the most essential part of their training abroad, which, however, had the advantage that they became acquainted with the new movements and wellarranged form which was essentially different from Paracelsus's own violent, polemic diction. Francis Bacon, the great English philosopher, said in this connection: "It is Severinus who had modulated the Brayings of that Ass (Paracelsus) .... and thus converted shocking and monstrous Fictions and Falsehoods into pleasing and delightful Fables".

The other physician who had been studying abroad was Hans Philipsen (Johannes Pratensis), who, in 1571, was appointed professor at the University of Copenhagen. But this

Fig. 2.
Domus anatomica, the first anatomical theatre of the University of Copenhagen, erected 1644 (Copperplate in the Medical-historical Museum).

characteristic of medicine in the sixteenth century: the reformative endeavours of Paracelsus and the restoration of anatomy by Vesalius.

In 1571 two young Danish physicians thus returned from a long journey abroad in the course of which they had been studying Paracelsism. The same year one of them, Peder Sørensen (Petrus Severinus), who soon after his return was appointed physician-in-ordinary to the king, gave an exposition of the disputed doctrines of Paracelsus. It aroused great attention in the whole of the learned world because of its clear institution did not favour new systems of teaching, and Hans Philipsen was, therefore, employed on the explicit condition that his instruction should follow the old lines and stick to Hippocrates and Galen.

Anders Christensen, who became a professor in 1584, had no better lot. He had studied anatomy at Padua, and attempted to introduce dissections of dead bodies in Copenhagen, but soon had to give up this form of teaching because people found it so disgusting that they would not be at table with him.

THE SEVENTEENTH CENTURY

It was not until the seventeenth century that the instruction at the University of Copenhagen had its renaissance. Active King Christian IV, who reigned during the first half of the century, did much good for the University. He had a new university building erected, which was inaugurated in 1601. He extended the university library and gave up a plot of land to be used for botanical gardens in order to promote the study of botany, which was so important to medicine in those days. In 1623 he established the "Regensen" as a free residence for undergraduates, and, finally, in 1644, he had a *Domus Anatomica* erected where anatomy could be studied by means of dissections.

At the beginning of this period the *medicus primus* of the faculty was Thomas Fincke (1561 to 1656), on the mother's side the ancestor of the large Bartholin family who dominated the University for three generations. One of his sons-in-law, Caspar Bartholin the elder (1585 to 1629), was *medicus alter*. They had both taken their doctor's degrees in Basel and commanded the entire knowledge of their time. Caspar Bartholin's name became famous early through his text-book of anatomy, *Anatomicae Institutiones Corporis Humani utriusque sexus* (1611). This little book, which was just a compilation from larger works, gave a clear and well-arranged survey of anatomy and was reprinted five times before the author's son, Thomas Bartholin, published a new and improved edition.

In 1624 Caspar Bartholin abandoned medicine, as he had become a professor at the most distinguished faculty of the University, that of divinity, a promotion which was possible because of the wide and varied learning of those days. He was succeeded by his brother-in-law, Oluff Worm (1588 to 1654), who advanced from the faculty of philosophy, which was the lowest at the University. Like his two relatives, Worm had studied abroad for several years and taken his degree as a doctor of medicine in Basel. He founded the famous *Museum Wormianum*, a natural-history collection which contained many curiosities. After his death it was incorporated into the king's cabinet of curiosities and has later been scattered to the four winds of heaven. Worm's name is attached to the Wormian bones, which he described.

None of these men, however, went in for practical anatomy in Copenhagen. A real study of anatomy was not commenced until, in 1639, the king called up Simon Paulli (1603 to 1680) from Rostock as a third professor of medicine to be paid from the king's purse. After the domus anatomica had been built, Paulli, in 1645, gave the first public anatomical instruction in Copenhagen, and he is also to be credited with the introduction of the systematical study of botany in Denmark. At the death of Christian IV in 1648 Paulli abandoned his professorship in favour of Thomas Bartholin, the son of Caspar Bartholin the elder.

THOMAS BARTHOLINVS, Casp. Fil. D. MED. ET ANATOM. IN ACADEM. HAFNIENSI PROFESS. REGIUS. *Ætatis* 39. A° 1655.

Fig. 3.
Thomas Bartholin (1616—1680). Copperplate in the Medical-historical Museum.

Thomas Bartholin (1616 to 1680) became world-famous through his discovery of the lymph vessels (1653). He was also first to demonstrate the thoracic duct in man, but he soon abandoned anatomy to the advantage of his other activities. In 1658 he published the first Danish pharmacopoeia, *Dispensatorium Hafniense*. He was the leader when Denmark's first medical act, Decree concerning Physicians and Dispensing Chemists of December 4th, 1672, was drawn up, and he published the first Danish scientific periodical, the *Acta medica et philosophia Hafniensia* (1673 to 1680). His principal work is his text-book of anatomy, based on his father's *Institutiones* of 1611, which was published by him in several revised and enlarged editions. The Bartholin text-books enjoyed such a wide circulation that for two generations they formed the basis of the study of anatomy in Europe. In the course of the years 1611 to 1686 no less than 30 editions were published in Latin, French, English, German, Dutch and Italian.

Thomas Bartholin's brother, Erasmus Bartholin (1625 to 1698), had taken his degree as a doctor of medicine in Padua, but he took much more interest in mathematical and physical

problems than in those of medicine. He has published the first experimental physical work in Denmark, the famous treatise on "The Iceland Crystal" (1669). In this he gave an account of the interesting fact — never seen before — that a ray of light on entering the crystal divides into two rays, and that only one of these follows Descartes's law of refraction. Erasmus Bartholin's biographer, Kirstine Meyer, writes as follows about the importance of this discovery: "The work of Bartholin proved momentous to future research by constituting the touch-stone for Huygen's undulatory theory of light. Huygens did not advance his theory until he found that it would explain the peculiar findings of Bartholin, which were unintelligible when looked upon from the angles of Descartes's or Newton's theories of light".

Among Thomas Bartholin's contemporaries, mention may be made of Oluff Borch (1626 to 1690) who was *professor ordinarius* of the classical languages and at the same time *professor extraordinarius* at the faculty of medicine where he lectured on chemistry and botany. Borch, who was an efficient physician, is the first who has described a case of lesion of the heart through non-penetrating injury (1676).

The most renowned of Thomas Bartholin's pupils was Nicolaus Steno (1638 to 1686), one of the great, international figures in the history of science. All medical men know his name from the ductus Stenonianus demonstrated by him in 1660, and geologists honour him as the founder of their science. Within anatomy he studied muscles and glands in particular. He was the first to demonstrate that the heart is nothing but a muscle. He established a new theory of muscle contraction and showed that the muscle fibre is the contractile element, whereas it had hitherto been considered that the tendon was the "primary instrument of movement". Steno demonstrated, 100 years before Haller did so, that a muscle contracts on direct irritation. He demonstrated the follicles of the ovary before de Graaf, and Peyer's patches before Peyer, but published his observations later than these men. At Steno's time there were learned men who thought that the tears were formed in the brain and were led through the nerves to the eye. Steno refuted this obsolete theory and gave an exemplary description of the lachrymal apparatus. He demonstrated the numerous small glands in the mucous membranes of the nose, palate and throat, he showed that the cerumen is secreted by glands, and also attributed the secretion of sweat to glandular activity. Moreover, Steno has shown that ligation of the descending aorta causes paralysis of the lower extremities, which is obviated when the ligature is loosened (Steno's experiment). In 1671 he published the first case of Fallot's tetralogy, a form of congenital disease of the heart which has been named after the French physician Louis Arthur Fallot, who described it again in 1888.

Steno spent most of his life abroad, especially in Florence, and his scientific career was only brief. In 1667 he was converted to catholicism, and in 1675 he took holy orders and then lived an ascetic life, aloof from all science, till his early death.

Fig. 4.
Nicolaus Steno (1638—1686). Painting by unknown master in the Galleria Uffizi, Florence.

Thomas Bartholin's son, Caspar Bartholin the younger (1665 to 1738), the last Bartholin in the medical faculty, demonstrated the greater vestibular gland and the sublingual duct.

THE EIGHTEENTH CENTURY

In the eighteenth century medical science in Denmark, as elsewhere in Europe, bore the stamp of the contest between *medici* and *chirurgi*. Ever since the Middle Ages the learned physicians had considered any dealing with practical surgery as being beneath their dignity and had left it to the barbers. The latter were given a training as mere artisans and, like other artisans, were organized in a guild. The faculty did nothing to improve the instruction, but nevertheless wanted to supervise the activities of the surgeons, and from 1668 every surgeon had to pass an examination by the faculty of medicine in order to be admitted to the guild.

The barber-surgeons were not allowed to treat internal diseases, but this prohibition was frequently violated, and actually the surgeons were the only doctors known by the masses; further, they acted as army and navy surgeons. In times of plague, when the learned doctors even in the seventeenth century fled from the city, the population also had to rely on the barber-surgeons.

In the eighteenth century the time had come when surgeons all over Europe wanted to improve both their training and their social standing. They met with stiff opposition on the part of the conservative universities, but enjoyed the support of the princes, who needed well-trained surgeons in the frequent wars.

In Denmark the figure-head was Simon Crüger (1687 to 1760), who had got the usual training of a barber-surgeon and had then been a regimental surgeon, a ship's surgeon and surgeon-inordinary to the king. In 1736 he had a surgical school, *Theatrum anatomico-chirurgicum*, established and at the same time was appointed general director of surgery. In this manner the faculty lost all influence on surgery, as the general director was entrusted not only with the teaching but also with the examinations and all appointments of surgeons.

The faculty protested forcibly against this interference with their established rights, and on several occasions plans were put forward with a view to assigning the teaching of surgery to the faculty. The development in Europe, however, tended in the opposite direction, and under this impression the surgeons won the day. In 1785 the Theatrum anatomico-chirurgicum was raised to an *Academia chirurgorum Regia*, and thus a new school of medicine had been founded alongside of the faculty: the examination passed at the Academy entitled the candidate not only to surgical but also to medical practice and, as they required no matriculation examination here — as did the faculty — the great majority of doctors were educated at the Academy.

Fig. 5.
Academia chirurgorum regia c. 1840. Painting by H. G. F. Holm in the Medical-historical Museum.

Fig. 6.
The Royal Frederik's Hospital. Copperplate from 1764 in the Medical-historical Museum.

At that time there was no medical examination at the University; the studies were concluded with the degree of doctor of medicine. Before the graduation ceremony, however, the candidate had to submit to an easy examination which was held within closed doors and "at wine and confectionery". These idyllic conditions ceased in 1769, when it was provided that the examination was to be public, and the new University Charter of 1788 introduced a complete oral and written examination. This entitled the candidate to practice and, therefore, it was no longer necessary to obtain the degree of doctor of medicine. Such were conditions till 1842 when the academy of surgery was abolished. Since then the faculty of medicine has been in charge of all education of medical men.

Another factor of decisive importance to the development of medicine in the eighteenth century was the establishment of the first hospitals, and a maternity hospital, which rendered possible a clinical instruction.

Denmark's first proper hospital was "Det kgl. Frederik's Hospital" founded in 1757 by Frederik V. It was the educational hospital of the University till 1910, when it was replaced by "Rigshospitalet". In 1769 the municipality of Copenhagen built the next large hospital, the "Almindeligt Hospital", which was also used for clinical teaching until, in 1863, it was replaced by "Kommunehospitalet" (Municipal Hospital).

The first public maternity hospital in Copenhagen was "Det frie Jordemoderhus" ("The Free Midwife Hospital"), which was established in 1750 and was managed by a midwife. In 1759 this institution was moved to "Det kgl. Frederik's Hospital", and in 1761 it was headed by a medical man, Christian Johan Berger (1724 to 1789), who became the first University professor of obstetrics. His successor, Mathias Saxtorph (1740 to 1800), made the Danish Maternity Hospital famous all over Europe. In 1787 the Maternity Hospital had its own building

where it remained until, in 1910, it was moved to "Rigshospitalet".

A third event in Danish medicine of this century was the foundation of The Royal Medical Society in 1772. This society, which is still alive, is the oldest society of graduated doctors in the world. The Medical Society of Edinburgh — it is true — was founded as early as 1737, but that is a students' society.

FIRST HALF OF THE NINETEENTH CENTURY

Of medical advances outside Denmark during this period, mention may first be made of Edward Jenner's vaccination against smallpox. Jenner's first publication appeared in 1798, and in 1801 Frederik Christian Winsløw (1752 to 1811) made the first vaccinations in Denmark with vaccine which he had received from Jenner. In 1810 vaccination became statutory in this country.

For internal medicine the greatest enrichment was Laennec's invention of the stethoscope. Laennec's famous book, *Traité de l'auscultation médiate*, was published in 1819, and in 1824 the stethoscope was introduced into Denmark by Oluf Lundt Bang (1788 to 1877).

During this period the great event happened in surgery that anaesthesia was introduced. Morton performed his successful demonstration of ether anaesthesia at the Massachusetts General Hospital in 1846, and in the same year the first anaesthesia was made in Denmark by Søren Eskildsen Larsen (1802 to 1890). Larsen was in all respects an eminent surgeon. He was well known for his successful plastic operations, in particular nasoplasty. He introduced tracheotomy in croup into this country. He described the socalled *syphilome anorectale* 25 years before Fournier, and, in 1848, he performed the first blood transfusion in Denmark.

Another advance in surgery was the introduction of the bloodless operations for calculi. The French surgeon Civiale undertook the first lithothripsy in 1824 with an instrument which cut up the stone by means of boring. In 1826 the Dane Ludvig Levin Jacobsen (1783 to 1843) constructed an improved instrument which cut up the stone by crushing it. It was awarded the prize of the French Academy. Moreover, Jacobsen will be known for his anatomical discoveries, the organon vomero-nasale (Jacobsen's organ) and the tympanic nerve (Jacobsen's nerve).

In 1809 McDowell, the American country doctor, made the first successful ovariotomy. In Denmark, too, this operation was first successfully performed in 1867 by a country doctor, Claudius Julius Boye (1823 to 1879), who became an honorary doctor of medicine on the occasion of the four hundredth anniversary of the University in 1879.

THE PAST HUNDRED YEARS

The past hundred years have been so eventful that it is only possible in this limited space to mention some of the pioneers in Danish medicine, while many other deserving men must be left unmentioned to save space. As will be easily understood no person still alive will be mentioned.

Modern microscopical investigation was commenced in this country by Adolph Hannover (1814 to 1894), the first histologist of Denmark. His most important work is *On Epithelioma* (1852) in which he gave the fundamental description of epithelioma, a term he introduced into terminology.

Fig. 7.
Peter Ludvig Panum (1820—1885). Painting by Aug. Jerndorff in the Carlsberg-Foundation.

The first Danish experimental physiologist was Peter Ludvig Panum (1820 to 1885), who, in 1867, founded the Institute of Medical Physiology of the University of Copenhagen. Among his works, mention may be made in particular of his investigations into embolism, transfusion and amount of blood, which was one of the essential reasons why transfusion of lamb's blood to human beings was definitively abandoned. Panum was the first to ascertain the presence of ptomaines in putrefied meat, and he published a text-book of the physiology of man, which was excellent for those times.

Panum was succeeded by Christian Bohr (1855 to 1911), who studied the physiology of

respiration in particular. One of Bohr's pupils was August Krogh (1874 to 1949), the animal physiologist, who was awarded the Nobel Prize in 1920 for his epoch-making investigations into the capillaries.

Fig. 8.
H. C. J. Gram (1853—1938). Photograph in the Medical-historical Museum.

A well-known name within biochemistry is Johan Kjeldahl (1849 to 1900), who was head of the Carlsberg Laboratory. He published his method for the determination of nitrogen in 1883. Another man of mark who was also attached to the Carlsberg Laboratory was Emil Christian Hansen (1842 to 1909). He revolutionized the brewing of beer by making pure cultures of yeast from a single cell.

Medical bacteriology was introduced into Denmark by Carl Julius Salomonsen (1847 to 1924), who, in 1883, had the University Laboratory of Medical Bacteriology established. Five years before Koch's discovery of the tubercle bacillus Salomonsen demonstrated, with Julius Cohnheim of Breslau, that tuberculosis can be transmitted from one animal to another by means of tuberculous material. He described the first method of isolating bacteria and, in 1902, founded the State Serum Institute, of which he was the first director until, in 1902, he was succeeded by the well-known Thorvald Madsen (1870 to 1957), who made the State Serum Institute world-famous.

In 1884 Hans Christian Joachim Gram (1853 to 1938) described his well-known differential staining with potassium iodide by means of which the bacteria can be divided into two large groups: the gram-positive and the gram-negative bacteria. In 1889 Knud Faber (1862 to 1956) demonstrated the tetanus toxin. Bernhard Bang (1848 to 1932), the veterinary surgeon, discovered, in 1896, the Bacillus abortus Bang, which causes undulant fever in man, and moreover he has gained great credit in counteracting bovine tuberculosis. Bang was the first who used the tuberculin test in cattle.

With regard to endocrinology, it may be mentioned that it was the Danish gynaecologist Frantz Howitz (1928 to 1912) who first suggested the peroral thyroid therapy in myxoedema.

In the domain of vitamins the paediatrist Carl Carl Edvard Bloch (1872 to 1952) has gained great credit by demonstrating that xerophthalmia in babies is due to vitamin A deficiency (1917 to 1918).

Experimental tumor research has had promiprominent pursuers in Denmark. Carl Oluf Jensen (1864 to 1934) was the first who transplanted a tumor for several generations, and Johannes Fibiger (1867 to 1928) was the first who succeeded in producing cancer experimentally. Fibiger's first publication on the spiropteracarcinoma appeared in 1913; he was awarded the Nobel Prize in 1927. Albert Fischer (1891

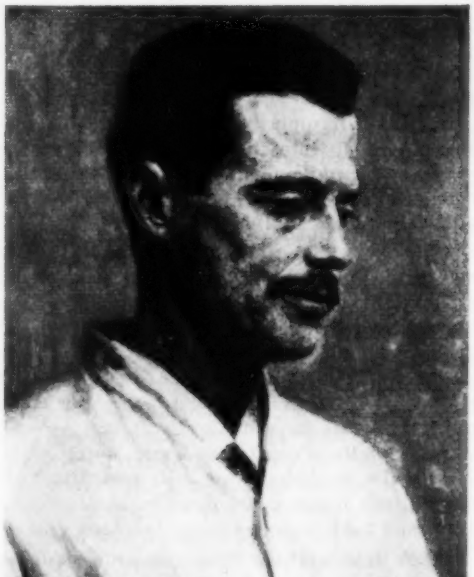


Fig. 9.
Niels Ryberg Finsen (1860—1904). Painting by Wentorf in the Finseninstitute.

to 1956) was the first to undertake systematic cultivation of cancer cells in tissue culture.

Fig. 10.
Carl Lange (1834—1900). Photograph in the Medical-historical Museum.

Within genetics, too, Denmark can mention a great name: Wilhelm Ludvig Johannsen (1857 to 1927). He was the first who sharply defined the distinction between genotype and phaenotype and definitively ascertained that acquired qualities are not hereditary. It was Johannsen who introduced the terms now used in genetics: gene, gamete, genotype, phaenotype etc.

One of the best known Danish names in medicine is undoubtedly Niels Ryberg Finsen (1860 to 1904), the founder of light-therapy. His first paper on the action of light on the skin appeared in 1893, and the same year he published his method of treating smallpox with red light. His greatest achievement, however, was the treatment of lupus vulgaris, which before his time was a terribly disfiguring and incurable disease for which the medical profession could do nothing at all. His work on this subject, *Om Anvendelse i Medicinen af koncentrerede kemiske Lysstraaler* (On Medical Employment of Concentrated Chemical Rays of Light) was published in 1896, the same year the Finsen Institute in Copenhagen was founded. In 1903 Finsen was awarded the Nobel Prize, but already the next year he died of the disease which had interfered with his activities since his youthful years (Pick's disease).

Another world-famous name is that of Hans Wilhelm Meyer (1824 to 1895), who, in 1868, described the adenoid vegetations of the nasopharynx. Meyer demonstrated the importance of these vegetations, not only to the occurrence of diseases of the ear, but also to the entire development of the child, and he described a method for their surgical treatment.

Mention may be made of a third name, which may not be unknown either, namely Harald Hirschsprung (1830 to 1916), who, in 1886, described megacolon congenitum, since then termed Hirschsprung's disease.

Carl Lange (1834 to 1900), on the other hand, may be less well-known, though he was the first to describe acute bulbar paralysis, a term he introduced into terminology (1868). However, Lange's principal work, written in Danish, is *Om Sindsbevægelser* (On Emotions) (1885), in which he describes the somatic symptoms of emotions (blushing, turning pale, trembling, etc.), and attempted to give a purely physiological explanation of the occurrence of emotions.

Denmark was the first of continental countries to accept Lister's antisepsis. The credit hereof is due to Mathias Hieronymus Saxtorph (1822 to 1900), who was professor at the University of Copenhagen, and Valdemar Holmer (1833 to 1884), who was senior surgeon at the Municipal Hospital of Copenhagen. In 1869 Saxtorph visited Lister in Glasgow, and in July,

Fig. 11.
Mathias Hieronymus Saxtorph (1822—1900). Photograph c. 1865 in the Medical-historical Museum.

Fig. 12.
Thorkild Rovsing (1862—1927). Photograph in the Medical-historical Museum.

1870, he wrote a letter to Lister in which he reported his results of antiseptic treatment. This was the first acknowledgement Lister received from the head of a large surgical department. This letter, which was published by Lister in The Lancet, stood him in good stead in his fight for the introduction of antisepsis, and he never forgot this support. More than 30 years later Lister wrote in a letter to Carl Julius Salomonsen who was mentioned above: "Well do I remember that my old friend Professor Saxtorph was the first of continental surgeons to adopt the antiseptic system".

As early as in 1868 Holmer had written about antisepsis, but he wrote in Danish in the annual report of the hospital, which was read only by a small circle.

Asepsis was introduced into Denmark by Oscar Bloch (1847 to 1926) who suggested the sterile bandage packing wrapped in two layers of filterpaper.

A Dane who came to exert a considerable influence on the development of American surgery was Christian Fenger (1840 to 1902). He passed his graduation examination in medicine at the University of Copenhagen in 1867 and then went in for pathological anatomy. As he could not obtain a suitable post in Denmark, he emigrated and, in 1877, arrived in Chicago where he was appointed prosector at the Cook County Hospital. He lectured here on pathological anatomy, which was a new subject in America, and at the same time acted as a surgeon at various Chicago hospitals. He was one of the pioneers of antisepsis, and Richard A. Leonardo in his History of Surgery calls him "the father of modern surgery in the West", who has influenced such famous surgeons as Ochsner, Murphy and the Mayo brothers.

The limited space does not permit any detailed mention of the development of surgery in Denmark, and, therefore, just two names will be mentioned: Axel Iversen (1844 to 1892) who, in 1891, introduced the surgical treatment of appendicitis into this country, and Thorkild Rovsing (1862 to 1927), who introduced modern urology into Denmark. Rovsing was a surgeon of international renown, and his Abdominal Surgery was translated both into German and English.

In the field of internal medicine the early Danish school studied the disorders of the alimentary system in particular. After the German, Kussmaul, had introduced the stomach pump in 1869, the great work of elucidating the diseases of the stomach was commenced and, pleased with the new diagnostic methods, many investigators were inclined to consider the anomalies of the gastric secretion as independent, primary disorders. The syndrome in gastric ulcer was thus described as gastrosuccorhoea, and achylia as a primary nervous disorder. Carl Edvard With (1826 to 1898) and Knud Faber (1862 to 1956),

Fig. 13.
Knud Faber (1862—1956). Photograph in the Medical-historical Museum.

the Danish clinicians, are greatly to be credited with the correction of this view. With described the clinical forms of gastric ulcer, its diagnosis and treatment, and also deserved well of his consistent treatment of appendicitis with opium, which was an advance at that time. Faber demonstrated the primary importance of chronic gastritis to achylia and to simple and pernicious anaemias, and, with his co-workers, yielded considerable contributions to the clinical picture and pathology of gastric ulcer. To this must be added his works on the functional disorders of the alimentary canal, and his large, complete expositions of the clinical manifestations of gastro-intestinal disorders in Danish and in German. It may also be mentioned that Faber as the head of a commission during the years 1908—21 carried through a complete reorganization of the Public Health Service in Denmark.

The University of Copenhagen was the only one in Denmark until, in 1928, it got a younger sister, the University of Aarhus. The faculty of medicine of the Aarhus University commenced its work by teaching a few subjects, but it has been constantly extended and, in 1955, the extension was completed, so that also the University of Aarhus can impart the complete medico-surgical training.

Last but not least it may be mentioned that a great event to the benefit of the medical profession took place in 1857, *viz.*, the foundation of The Danish Medical Association (Den almindelige danske Lægeforening). The Danish Medical Association counts almost every Danish doctor from the youngest graduate to the oldest professor as a member. During the past hundred years it has successfully worked not only for the economic and social standing of the doctors, but also for the post-graduate training and perhaps, most of all, for the ethical standard of Danish physicians.

THE ROLE OF THE HOSPITAL IN THE PUBLIC HEALTH PROGRAMME

By JOHANNES FRANDSEN

It seems to me that in the discussion on the role of the hospital in the Public Health Programme, there is a tendency to set up as the ultimate object the hospitals not only as centres for medical care but also in all essentials as centres for health care.

For thinly populated regions with insufficient means of communication this seems natural and the only practicable road for the development of a health service.

Countries whose health service is in the process of development and who are still under-supplied with physicians, no doubt will also find it an advantage to place the hospital as a centre for the various functions of the health service, even if this need not be the final object. But in this as in everything else, political viewpoints are always liable to decide matters.

But for the many countries who are fully supplied with physicians and have their health service built up more or less upon traditions, matters are rather different and less simple. This is not saying that under such conditions the question is of less interest and gives rise to fewer problems. On the contrary.

Denmark is one of these countries; it is densely populated and has an adequate supply of physicians (one to every 860 of the population) (see appendix). What I wish to say as a contribution to the discussion is based exclusively upon experience I have gained in many years of work in the service of my country's health; but I hope that the fundamental viewpoints at which I have arrived will be of more universal application.

The subject of our discussion will best be dealt with by dividing the question into:

1) the hospitals and medical care.
2) the hospitals and health care.

The answers will provide the basis for the final evaluation of the role of the hospital in the public health programme, with consequent demands on the efficiency and capacity of the hospitals and the organization of the hospital service.

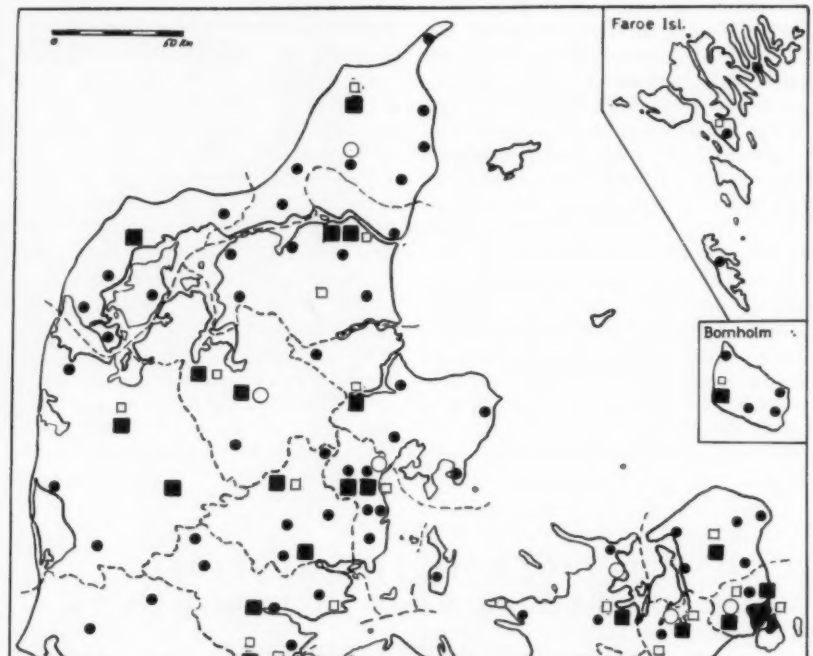
During the past generation attention and economic forces have been concentrated on the hospital, the place where the revolutionary progress of our science has first and most completely been taken into the service of medicine — in the work of examining and treating the sick.

It is only natural that attention has been directed towards the hospital and the wonders that could be performed there. Public confidence has grown correspondingly. The increasing intensity of hospital work and its growing demands on the knowledge and skill of the hospital physician have also called for a regular medical staff — by the hospital staff I am referring only to the staff employed by the hospital.

Medical care has been split up into the work at the hospitals and the work outside them.

To the same extent as the medical staff at the hospital has been given such greatly widened possibilities for effective work by reason of the

Statement by the Chief-Delegate of Denmark to the Tenth World Health Assembly.



HOSPITALS IN DENMARK 1957

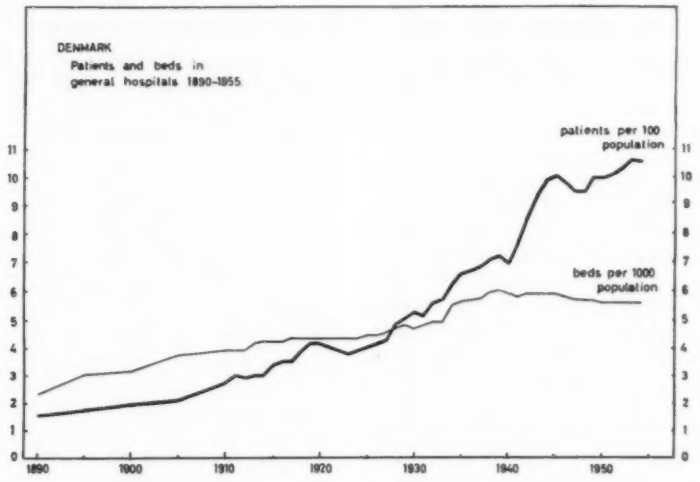
■ Central hospitals
● General hospitals
□ Tuberculosis institutions
○ Mental hospitals

ever increasing investment in laboratories, radiological departments and so on, the position of the general practitioners working in the extramural service of medical care has been impaired. They are compelled to send patients to hospital solely for examination purposes as the only way of sharing in the hospital's improved examination techniques. But medical care is indivisible. The modern technical aids, diagnostics and treatment are equally necessary for all medical practice, wherever it may be performed.

Therefore, the question today is whether that group of well-trained medical men who practise their profession outside the hospitals, for the greater part as general practitioners, family doctors, are to be further impaired in their professional work and, in the final instance, subjected to the hospital out-patient department under a chief appointed by the hospital — or whether these general practitioners are to be given the possibility of practising on an equal footing with their colleagues in the hospitals.

To me there cannot be the slightest doubt as to the choice. The family doctor concept holds values so great that it cannot be dropped, and the growing specialization intensifies still more the need and the demand for the maintenance of a fully efficient, all-round trained force of general practitioners.

The general practitioner must rank with the hospital physician in the use of the hospital's technical aids to examination in collaboration with the specially trained physicians of the testing laboratories, and with opportunities for inti-



mate collaboration with the hospital's clinical specialists and with privately practising specialists where these are to be found.

By virtue of this development the hospital, as has already been said, could not but become a dominating part of the health service; but what we have to do now is to put it in its proper place. The hospital should not only continue its traditional objects of examining and treating patients who can only be treated in hospital. Its research departments with their costly installations and independent, specially trained medical chiefs, must be common to the clinicians in and out of the hospital, must be the bridge between hospital and general practitioner, so that the hospital without dominating practical practice outside of its walls becomes an indispensable part of the whole medical care within the community.

This development within medical care, in full operation at any rate in my country, of course requires that the matter of payment is brought into line, whether medical care is paid for through sickness insurance with municipal and State support or whether it is wholly defrayed by the State. There must be full access for anybody who is sick to obtain the correct and timely treatment without having to abstain for pecuniary reasons.

Although many arguments may be advanced to show that the hospital should also have a place in the front row of health care, there are many weighty and perhaps decisive arguments against building health care around the hospital. In this connection I disregard the special hygienic tasks of the officers of health, and also the special circumstance connected with the fight against tuberculosis, in which the work of the chest clinics must have a tuberculosis hospital as the centre; and of course it is also natural that psychiatric prevention emanates from a mental institution.

It is the organization of that part of health care which comprises health control in its various forms, vaccinations, etc., which in our discussion must be evaluated in relation to the hospital.

I venture to assume that there is general agreement that this aspect of prevention, as in fact all forms of health care, must conclusively be based upon the understanding and help of the population. The broader the surface of contact between the medical exponents of that work and the population, the quicker will the work reach out to every circle and give good results. Provided this is true, it must be admitted that the hospitals will not suffice, no more than the small number of physicians working as officers of health, compared with what could be achieved if it were possible to enlist the entire medical profession, and especially the general practitioners, for the work.

This is true at any rate in Denmark. General antidiphtheria vaccination, enacted as an offer of free vaccination (paid for by the State) to all under 18 years of age, was entrusted to the general practitioners and carried through, so that in the course of two or three years we could close the hospital departments intended for diphtheria patients. This is only one example of the value of associating the general practitioners with the work of prevention. With their help we succeeded quickly in spreading an understanding of the value of the offer. It has been the same with the health check-up of pregnant women, or of children up to their 15th year, and with polio-vaccination.

In uniting public health and general practice we could create something much greater than from either separately, and with better results than by connecting public health with the hospitals. The general practitioner should be the first and most

important agent in dealing with these — the central figure in health care.

From a purely administrative point of view, nothing is to be gained by connecting this part of the general practitioner's work to the hospital administration. The administration of this health care is arranged most naturally by the local government councils with the local administrative organs and the central health authorities. In this as in the curative work the hospital laboratories should be at the disposal of the general practitioners, for we most not overlook what great advantages lie in centralizing certain laboratory tests for large areas. For example, the State Serum Institute in Copenhagen acts in a most valuable manner as the common laboratory for the whole country, for physicians and medical officers in epidemics, intestinal infections, sputum and blood tests, for instance serological tests for syphilis, with the result that in the course of the past thirty years it has been possible to complete a file at the Institute of all tests for syphilitic reaction, a test that is made as a matter of ordinary routine for all who are admitted to Denmark's hospitals.

The conclusion arising from what I have said is that the role of the hospital can no longer be restricted to receiving and treating patients who cannot obtain the necessary treatment elsewhere.

The hospitals should be the natural centres for the laboratory tests and other technical research work necessary for the examination and treatment of the sick both within and outside the hospital, so that every physician has access to them without sending his patient to hospital or to another physician.

But it would scarcely be advisable to build up health care with the hospital in the centre.

Finally, a few brief remarks on the organization of the general medico-surgical hospitals.

I agree that decentralization with independent management for each hospital area may provide good possibilities for maintaining an effective hospital service.

In my country the counties, with an average population of 100,000—150,000, form natural hospital regions, and each county's hospital service is carried on by the county and town councils together. Each region has one or two so-called central hospitals with many specialties, and two to four smaller hospitals (100 to 150 beds), originally with only one chief (a surgeon), but in recent years more and more converted so as to have three chiefs: a surgeon, an internist and a radiologist, with the internist as the head of the medical laboratory, etc.

I wish to emphasize that I consider it extremely important that the heads of the smaller hospitals are fully equal in qualifications with the heads of the central hospitals. The value of the central hospital lies in the large number of special departments and the large, more all-round laboratory equipment, with independent chiefs. Consequently, it is not usual to transfer patients from a small hospital to the central hospital, or vice versa, but it is usual for the smaller hospitals to requisition the aid of special knowledge from among the specialists of the central hospital. Within the area all hospital units, wherever they may be situated, are regarded as belonging to the same hospital block with the same access to mutual help and co-operation, and in this connection there may be transfers of patients from one unit to another. Co-operation between the area's surgical or medical hospital departments makes it possible to divide surgery or medicine into sub-specialties.

As far as I can see, a country's hospital service built up by regions should be financed wholly or partly by local taxation or by the State, but without interfering with the local government of the region in that respect.

Mental hospitals and certain other special hospitals require larger territories and an organization adapted accordingly, but preferably in co-operation with the ordinary hospital service.

Teaching and research are inseparable from the hospital, large or small, though in different degrees. This applies to the university hospital and to the hospital with only a hundred beds. The subordinate posts for physicians should be both professional and educative. The same of course applies to the education of nurses and administrative personnel.

The function of a hospital as a place of assembly for the medical practitioners is of immense importance. Hospital physicians and practitioners meet there at patient demonstrations and for the discussion of scientific and practical questions — all on the same level and for mutual instruction. No doubt the hospital physician will have most to impart, but the general practitioner has experience and knowledge of cases which the hospital physician rarely or never sees, and this makes *him* the instructor.

THE CLASSIFICATION OF DISEASES IN GENERAL PRACTICE

ON THE BASIS OF W. H. O.'s INTERMEDIATE LIST OF 150 CAUSES

By JENS VILH. DAHLERUP

Should a general practitioner wish to work out a statistical survey of the diseases he has treated during a certain period of time, he is faced with two problems in particular: collecting the material and classifying the diseases. The case records of the general practitioner are not intended for scientific work, and it is seldom he has enough time to keep the records in such a manner that they can be used for this purpose later. It has been done once before here in Denmark, by Høeg in 1952 (29), but this is the only instance.

As Høeg states in his thesis (p. 49), the material can be collected in various ways:

1) By statistically trained interrogators (Sydenstricker (43), Collins (6), The Danish Morbidity Investigation of 1950 (2)).

2) By brief returns from general practice (Sjövall (42), Trier Hansen (26), Holm (27), Pemberton (35), McGregor (24), Dahl (8), Dahlerup (9, 11, 12), Fry (18), Taylor (44)).

3) By a combination of 1) and 2), entering information from general practice on punched cards (Kurkin (31), DePorte (38), Logan (33, 34)). My own opinion is that it is an advantage when one and the same person collects and works up the material, when it is a question of examinations in general practice.

The figures I have quoted here were collected on the basis of a series of punched cards which I kept daily myself for the period of one calendar year (1956). The cards were filled in while the patients were still in my surgery, or immediately after my return from my rounds. I feel that this makes the investigation more exact and diminishes the chance of anything being forgotten. As a result of this procedure, a number of the diagnoses made in general practice must of necessity be provisional, but here the actual counting and classification were first started three months after the termination of the investigation, and all diagnoses were corrected as far as was possible. In the case of all patients hospitalized or referred to specialists, the final diagnosis was first entered after a discharge card was available. This does not imply, however, that I felt I had to alter my diagnosis in all cases of disagreement.

The other problem was to find a classification which suited the purpose. In the present survey, the World Health Organization's classification "Intermediate list of 150 causes", the A-list, is used (47, in what follows referred to as WHO). A survey will appear later, worked out on the basis of the "Detailed list" and "Special list of 50 causes".

The reason I have chosen the "Intermediate list" as the first one is because I feel that it is best suited to general practice. It is suitably short and clear for the purpose, and the groups are broad enough to give numbers of such a a size that it is permissible to draw conclusions from them (cf. Tables 2 and 3). Another advantage with this list is that one completely avoids the question of nomenclature, which apparently is insoluble, as long as national self-esteem is so strongly active within this field. In order to rectify this lack among others, WHO's alphabetical part has been translated in Latin (48), but for one thing it is only a slavish translation of WHO, in which missing diagnoses, for example, are not included, and for another, it is rather doubtful whether it will have any wide circulation. A final solution of the problem is possible by producing the alphabetic index in Latin, in a widely expanded form, almost like an encyclopedia, giving every medical phrase which might be considered. In the case of all those designations which should not be used, a reference should be given to the designation recommended by the World Health Organization. All eponyms should be included (39), and there should be numerous cross references, so that the work could always be referred to in order to find out how the codification should be carried out. In this book there should be no abbreviations of the designations recommended by the World Health Organization, so that the spelling could also be obtained correctly. I have mentioned these matters in a previous article (10), drawing attention at the same time to the fact that a number of well-defined abnormal conditions are not found in WHO. Among these a few might be mentioned, for example: acute alcoholic excitement, restless legs, menstruatio incompletam, nail-biting, congenital inversion of the nipple and Oberi's syndrome. Further, definite rules should be stated for the classification of more indeterminate designations, such as, for example, "spring fatigue". The individual countries can then work out their own nomenclature, provided there is a reference to WHO's code figure. For that matter, this has been done in Sweden (1) and Finland (3). This encyclopedia, just like WHO's, should be subject to decennial revision and extension.

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As regards choosing Latin as the main language for such a work, there is for that matter no agreement. Reserve was shown for the proposal already by Farr (17). Nor was Yves Biraud (5) any supporter of Latin, and he supplies (p. 203) several examples of not unambiguous Latin designations, but it should be possible to overcome this difficulty with the aid of accepted definitions.

A plentiful literature is available on classification and nomenclature. The subject is discussed clearly and briefly in the introduction to WHO. Among the important works — the majority of them with elaborate literature references — might be mentioned the following: Young 1813 (49), Hosack 1821 (28), Farr 1839 (16) and 1856 (17), Bertillon the younger 1895 (4), White 1900 and 1901 (45, 46), Rolleston 1909 (39), Knibbs 1929 (30), Faber 1930 (14) and Greenwood 1941/46 (23).

Felix Plater the elder (36) was the first to draw up a systematic nosology (1602) (14, p. 21, 25, p. 625). When Rolleston (39) quotes F. Plater, 1680, as the first, this is because in 1680 Franz Plater (25, p. 626), the grandson of the brother of Felix Plater the elder, published a new edition of Felix Plater the elder's book, in which he (Franz Plater) himself wrote a section with the result that he now stands as the author of the work (37). Plater's nosology, like all the first nosologies, was arranged on the basis of disease symptoms. The best known and most used of the older nosologies was that of Sauvages from 1763 (41). Sauvages issued a precursor of this in 1731 (40) in French, and it was this book which was the cause of the acquaintanceship and collaboration between Sauvages and Linnaeus through many years (14, p. 21). Sauvages' nosology was later replaced by that of Cullen, 1769 (7). This book achieved an enormous circulation and was the one most used for many years, in spite of innumerable other attempts to produce nosologies. It is not surprising that the systematizer Linnaeus in 1763 (32) also tried to classify diseases into orders and families. The nosology of Linnaeus is outstanding for its brevity and clarity. J. M. Good was the first to produce a nosology based on the idea of a system which could be used for the statistical enumeration of diseases (19, 20 and 21). His aim was the production of a physiological-systematological work covering the entire field of medicine. His nosology from 1817 received the approbation of the Royal College of Physicians.

It was with Farr's pioneering work in 1837 (15) and 1839 (16) that the whole of medical statistics took on more definite outlines. He saw the necessity of not imposing too absolute demands, as thereby one easily forces those using such a scheme to make a certain diagnosis, where in actual fact such a diagnosis cannot be reached on the grounds available. He recognized that if one made the classification too narrow, more faults of registration would be obtained. Farr's classification was the first which was worked out with the direct aim of carrying out medico-statistical investigations in a population group. There are several fundamental points of similarity between this classification and WHO's. He groups the diseases according to whether they occur endemically, sporadically or epidemically, a state of affairs which is of the greatest medico-statistical interest. Within these groups, he then groups the diseases partly according to systematic, partly according to anatomical points of view. At the first international statistical congress in Brussels (17, 4) Farr was invited — together with d'Espine — to produce a unified nomenclature and classification. This did not pass without swords being crossed (4, p. 262). The reason was that d'Espine wanted to classify the diseases according to their "nature", that is to say, a principle of classification which would quite rapidly alter as our knowledge of the diseases increased, while Farr held to his earlier principle. Farr succeeded in winning sympathy for his point of view, and in 1855 the result was "adoptée" at the second international statistical congress in Paris.

The French statistics of causes of death originate from 1864 and are based on Farr's principles (4). In 1893 Bertillon the younger produced his classification, which is anatomical in principle.

The conditions in Denmark have been discussed from a historical point of view in Børre Johansson's thesis (Copenhagen 1946). From 1943, Gram's diagnosis list (22) was used for the hospital returns, but when Denmark, together with 28 other countries at the Paris Congress of 1948, subscribed to the widest possible use of the new classification, this came into use from 1951 in the official statistic of the causes of death (47). A revision of Gram's diagnosis list in conformity with the WHO classification is being undertaken at the moment by the Danish medical authorities. For that matter, the WHO is a continuation and revised edition of the previous League of Nations nomenclature from 1938, but what is completely new about WHO's is that it is also a classification of disease and not — as previously — exclusively a classification of causes of death.

In Sweden (1) and Finland (3), Latin translations of WHO have been made, with certain changes. The Finnish translation keeps very closely to WHO, while the Swedish one has a special set of code numbers for accidents, which will make the Swedish returns difficult to compare with those of other countries.

Psychiatric diagnoses constitute a special field in themselves. Within this special branch, there exists great dissatisfaction with WHO. This dis-

satisfaction found official expression in 1952 (13) in the diagnosis committee of the Danish Psychiatric Society. It was urged on this occasion that it is not remarkable that WHO cannot be used, as ".... it is of course not primarily adapted to hospital psychiatric wards". The same objection against WHO could be made by anyone, as in the nature of things it cannot be arranged with a single speciality in mind. I myself have clearly felt that the WHO classification was not especially intended for general practice. It is in fact intended for arranging diseases in groups, so that the total result is amenable to statistical treatment, and it is there the difficulty arises, because we physicians are forced to adopt other than the usual points of view. But for all that it is still unfortunate that a group should "break out" and establish their own classification. The circumstances are particularly complicated because of the fact that the classification accepted by the Scandinavian psychiatrists is very difficult to work with for non-psychiatrists. The objections directed toward the use of WHO are not particularly convincing to a nonpsychiatrist. It is true that the condition: "acute alcoholic excitement" is not found in WHO, but such a diagnosis should then be added. As stated, it is not the only one which is missing. Psychogenic psychosis is lacking, but it can be introduced under code number 309. The classification of the psychopathies is unacceptable for Scandinavian psychiatrists, but from a statistical point of view the more subtle classification is of secondary importance, so long as all the psychopathies are classified under code number 320. The main difficulty no doubt lies in the fact that in the field of psychiatry, more than in any other speciality, very fluid concepts are employed, so that each case provokes discussion. The reason I have fastened so much on this particular subject is because the psychiatrists are the only group who have collectively sought to go around WHO, even though possibilities have been made available for the transfer of the diagnoses from the one to the other classification.

My own material comprises, as stated, all diagnoses made in my practice throughout 1956. Only those groups are given in which there have been diagnoses made. Also, in the reference to the "detailed list", only those groups have been included within which diagnoses have been made. If, for example, in the reference to the "detailed list" there stands 210—216, this means that there has been at least one case within each of these 7 groups. The list comprises in all 5258 cases within group A, and 643 cases within group AN (N = nature). (See Table 1). The AE code (E = external cause) is not used, this not having been included when filling out the punched cards. There has been no discrimination between main and subsidiary diagnoses, as this is not possible in general practice. Only those diseases have been recorded which brought the patient for examination, or which the patient mentioned in another connection during the consultation. For example, in my practice I have not recorded all cases of overweight. These have only been entered if the patient complained of his or her obesity.

Table 1.

	A-code	AN-code	Total
Children	1478	202	1680
Men	1350	269	1619
Women	2430	172	2602
Total	5258	643	5901

The punched cards used in the work will be subjected to a closer study in a subsequent work. In all, somewhat less than 5,000 cards were used for the whole work, as several diagnoses were entered on the same card wherever it was feasible. The practice is a mixed provincial practice in a town of about 18,000 inhabitants, and comprises approximately 3,000 patients.

As will be seen, there are considerably more diseases recorded for women than for men, which is in good agreement with the morbidity investigation of 1950, 3rd report, p. 15 (2). It will be observed that "accidents" constitute approximately 11 per cent of the total number of diagnoses.

There were in all 18 deaths. The 12 of these fall within the group of malignant diseases. There were 4 cases of cardiac death. One death (in an 81-year old man) was due to an incarcerated obturator hernia. Finally, a three-day old infant died on account of a patent foramen ovale.

As regards the numerous registration difficulties experienced, reference is made to a forthcoming work, where each individual group will be subjected to discussion.

To sum up, it may be stated that in spite of faults and omissions, WHO is really a very suitable classification of diseases, and one must look forward with pleasure to seeing future works of medical statistics clasified according to the lines indicated therein. It provides the only possibility of obtaining comparable results from regions which are geographically distinct.

It has been my intention in the present work to show that an enumeration and registration is possible in general practice, and that by means of a suitable classification the figures become large enough to permit of statistical treatment.

References:

1) Statistisk Klassifikation av Sjukdomar, Skador och Dödsårsaker. (Statistical classification of diseases, traumas, and causes of death). Stockholm 1952.

2) Danish Morbidity Survey of 1950. Third communication 1953. Fourth communication 1955.

Table 2.

Intermediate list of 150 causes for tabulation of morbidity and mortality.

A	Cause groups	Detailed list numbers.	under 1 year	1–6 years	7–15 years	16–45 years M	16–45 years F	46–65 years M	46–65 years F	66 years and over M	66 years and over F	Total	Deaths
1	Tuberculosis of respiratory system	002, 006			1	3	4	2				10	
4	Tuberculosis of bones and joints	012, 013				1	2		1			4	
5	Tuberculosis, all other forms	015	1									1	
7	Early syphilis	021				1						1	
8	Tabes dorsalis	024					1				1	2	
10	All other syphilis	026, 027, 029					7	2			1	10	
11	Gonococcal infection	030				7	6					13	
19	Erysipelas	052				1	1		1			3	
22	Whooping cough	056	34	100	16	5	5					160	
28	Acute poliomyelitis	080					1					1	
29	Acute infectious encephalitis	082	1									1	
32	Measles	085	11	43	24		1					79	
34	Infectious hepatitis	092		1	2	1						4	
42	Other diseases due to helmints	126 130	2	16	23	10	18	1		1		71	
43	All other diseases classified as infective and parasitic	039, 070, 081, 086-089, 096	11	21	20	46	28	6	3	1		136	
47	Malignant neoplasm of intestine, except rectum	153							1			1	
48	Malignant neoplasm of rectum	154						1	1*			2	1 mors
50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary	162						1*		1*		2	2 mors
51	Malignant neoplasm of breast	170					1*		4**			5	3 mors
52	Malignant neoplasm of cervix uteri	171					2		2			4	
53	Malignant neoplasm of other and unspecified parts of uterus	172							1			1	
54	Malignant neoplasm of prostate	177						1*				1	1 mors
55	Malignant neoplasm of skin	191						3				3	
57	Malignant neoplasm of all other and unspecified sites	158, 160, 175, 180					1	1*	2*			4	2 mors
58	Leukaemia and aleukaemia	204						1				1	
59	Lymphatic and other neoplasm of lymphatic and hæmatopoietic system	200, 201, 205						2**	1		1*	4	3 mors
60	Benign neoplasm and neoplasm of unspecified nature	210, 216, 220-223, 226-228	3		5	9	24	1	10	1		53	
61	Nontoxic goiter	250, 251				1	5					6	
63	Diabetes mellitus	260				2			2	3	2	9	
64	Avitaminosis and other deficiency states	283-286	4	2			1				1	8	
65	Anaemias	290-293		4	11	1	38		8	1		63	
66	Allergic disorders; all other endocrine, metabolic and blood diseases	240-245, 253, 254, 270, 275, 277, 287-289, 295, 296	16	27	25	26	86	13	34	4	7	238	
67	Psychoses	300-304				3	1	2	3	2	3	14	
68	Psychoneuroses and disorders of personality	310, 311, 313-318, 320-324, 326	3	23	28	68	150	27	25		6	330	
69	Mental deficiency	325			2	3	6		2			13	
70	Vascular lesions affecting central nervous system	331, 332, 334						2	3	4	6	15	
71	Nonmeningococcal meningitis	340			1							1	

A	Cause groups	Detailed list numbers.	under 1 year	1–6 years	7–15 years	16–45 years M	16–45 years F	46–65 years M	46–65 years F	66 years and over M	66 years and over F	Total	Deaths
72	Multiple sclerosis	345					2					2	
73	Epilepsy	353		1	1	3	2		3	1		11	
74	Inflammatory diseases of eye	370-372, 374-376	8	13	9	11	20		5		1	67	
75	Cataract	385									3	3	
76	Glaucoma	387									1	1	
77	Otitis media and mastoiditis	391, 392	22	65	34	36	22	4	5	1		179	
78	All other diseases of the nervous system and sense organs	350, 351, 354, 355, 360-363, 366, 368, 380, 381, 384, 388-390, 394-396, 398	2	5	28	73	79	28	25	5	19	264	
79	Rheumatic fever	400					2					2	
80	Chronic rheumatic heart disease	410				2						2	
81	Arteriosclerotic and degenerative heart disease	420						13*	9*	8	12*	42	3 mors
82	Other diseases of heart	433, 434					1		4	3*	3	11	1 mors
83	Hypertension with heart disease	440						1	2		6	9	
84	Hypertension without mention of heart	444, 446, 447				3	3	3	7	1	15	32	
85	Diseases of arteries	450, 453, 454			2	7	20	6	8	8	13	64	
86	Other diseases of circulatory system	460-465, 467, 468		3	10	29	18	8	12	1	6	87	
87	Acute upper respiratory infections	470-474	45	88	46	109	146	17	16	5	2	474	
88	Influenza	480-483		3	6	23	16	5	8	1		62	
89	Lobar pneumonia	490	2	2			1		1	3	1	10	
90	Bronchopneumonia	491	1		2							3	
92	Acute bronchitis	500	18	56	20	10	25	1	7	1	1	139	
93	Bronchitis, chronic and unqualified	501, 502	13	9	4	19	9	19	13	6	6	98	
94	Hypertrophy of tonsils and adenoids	510		32	16	4	6		1			59	
95	Empyema and abscess of lung	518							1			1	
96	Pleurisy	519				2		2				4	
97	All other respiratory diseases	511-517, 520, 526, 527	5	13	10	22	18	7	10	1	2	88	
98	Diseases of teeth and supporting structures	530-533	11	9	4	16	36	1	3	1	3	84	
99	Ulcer of stomach	540				2	3		1	1		7	
100	Ulcer of duodenum	541				2	1	4	2	2		11	
101	Gastritis and duodenitis	543			1	31	29	14	11	2	3	91	
102	Appendicitis	550, 552			5	7	5				1	18	
103	Intestinal obstruction and hernia	560, 561	8	2	1	4	1	3	1	2*	1	23	1 mors
104	Gastro-enteritis and colitis, except diarrhoea of the newborn	571, 572	19	30	6	18	16	2	6	1	2	100	
105	Cirrhosis of liver	581					1		2			3	
106	Cholelithiasis and cholecystitis	584, 585				4	7	5	10	1	4	31	
107	Other diseases of digestive system	536-539, 544, 545, 573-575, 577, 578, 583	10	6	4	19	39	7	19	3	5	112	
109	Chronic, other and unspecified nephritis	592				2	2					4	
110	Infections of kidney	600	1			1	1					3	
111	Calculi of urinary system	602				1	6	3				10	
112	Hyperplasia of prostate	610				1		3		9		13	

A	Cause groups	Detailed list numbers.	under 1 year	1—6 years	7—15 years	16—45 years M	16—45 years F	46—65 years M	46—65 years F	66 years and over M	66 years and over F	Total	Deaths
113	Diseases of breast	621	1				4		1	1		7	
114	Other diseases of genito-urinary system	601, 603, 605, 607, 609, 611, 613-615, 617, 622-626, 630-637	1	10	8	29	263	5	49		13	378	
115	Sepsis of pregnancy, childbirth and the puerperium	640, 641					2					2	
116	Toxaemias of pregnancy and the puerperium	642					17					17	
117	Haemorrhage of pregnancy and childbirth	644, 672					6					6	
118	Abortion without mention of sepsis or toxaemia	650					22					22	
120	Other complications of pregnancy, childbirth and the puerperium	645-649, 688, 689					206					206	
121	Infections of skin and subcutaneous tissue	690-696, 698	2	29	65	56	32	17	5	1		207	
122	Arthritis and spondylitis	772, 723, 725				4	5	4	11	3	13	40	
123	Muscular rheumatism and rheumatism, unspecified	726		1	4	66	133	24	25	3	6	262	
124	Osteomyelitis and periostitis	730			2	1	6					9	
125	Ankylosis and acquired musculoskeletal deformities	745-747, 749		13	10	13	20	6	7			69	
126	All other diseases of skin and musculoskeletal system	700-710, 712-716, 732-735, 738, 741, 742, 744	19	18	21	79	109	22	23	3	5	298	
128	Congenital malformations of circulatory system	754	1*	4								5	1 mors
129	All other congenital malformations	756-759	4	3	1	6	5	3			1	23	
130	Birth injuries	760, 761	2									2	
132	Infections of the newborn	766	7									7	
134	All other defined diseases of early infancy	772	2									2	
135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	773	2									2	
136	Senility without mention of psychosis	794									2	2	
137	Ill-defined and unknown causes of morbidity and mortality	780-791, 793, 795	12	19	25	48	63	9	12	2	4	194	
	Total		304	671	503	941	1819	311	429	98	182	5258	

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Table 3.

"N" code. Alternative classification of accidents, poisonings, and violence (Nature of injury).

AN	Cause groups	Detailed list numbers.	under 1 year	1–6 years	7–15 years	16–45 years M	16–45 years F	46–65 years M	46–65 years F	66 years and over M	66 years and over F	Total
138	Fracture of skull	N 802				2		1				3
139	Fracture of spine and trunk	N 805, N 807				2		1				3
140	Fracture of limbs	N 812-N 817, N 820-N 825, N 828		1	12	14	5	3	4	1	1	41
141	Dislocation without fracture	N 831-N 834, N 836	1	3	1	4	4					13
142	Sprains and strains of joints and adjacent muscle	N 841, N 842, N 844, N 845	1		15	26	16	4	10		2	74
143	Head injury (excluding fracture)	N 850-N 852	2	13	8	16	15	2	5	1	2	64
144	Internal injury of chest, abdomen and pelvis	N 861, N 867				1				1		2
145	Laceration and open wounds	N 870, N 872, N 873, N 875, N 877, N 879, N 881, N 883-N 885, N 887, N 890, N 891, N 893, N 902, N 903	3	11	16	46	15	9	2		3	105
146	Superficial injury, contusion and crushing with intact skinsurface	N 910-N 917 N 920-N 929	1	18	43	62	38	16	10	3	4	195
147	Effects of foreign body entering through orifice	N 930-N 933, N 935		7	5	29	5	1	1			48
148	Burns	N 940-N 945	1	8	2	4	6	2	2			25
149	Effects of poisons	N 961-N 963, N 968, N 970, N 971, N 974, N 979	1	6	3	12	9	3				34
150	All other and unspecified effects of external causes	N 951, N 981, N 989, N 993, N 995, N 997-N 999	2	7	11	2	9		4	1		36
	Total		12	74	116	220	122	42	38	7	12	643

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MORBIDITY STATISTICS FROM GENERAL PRACTICE

ANNOTATION

In Odense, a town of about 100,000 inhabitants, seven general practitioners have studied the morbidity in their practices for a period of one year, September 1, 1949 — August 31, 1950. Their paper has been published in Ugeskrift for Læger (1957, *119:* 1148) in Danish, with text to the charts and diagrams in English.

The object is to give an evaluation of the loss of working days and the corresponding problems. Diseases not causing incapacity, as well as the doctors' work in general, are not taken into consideration. For this reason only people above the age of 15 are included in the material. Every time a person was reported ill, or was known to be out of work on account of disease, a punched card was filled in. The basis of the work is that the doctors have a panel list of their total clientele so that any finding can be given as a percentage.

The seven doctors' total clientele are arranged according to sex and age, and are shown to be in close conformity with the population of the town. From a total clientele of 12,189 persons, there were 1833 cases of illness in 1544 persons who were reported absenst from work.

It is generally alleged that women in work have more frequent and longer periods of illness than their male colleagues. The crude rate of the present material, however, shows fewer reports among women. Considering the distribution according to age, a preponderance of women below 25 years is found in comparison to men, while women above that age recede. Though the material cannot give the statistical proof, it is beyond discussion that the reason for this distribution is that a great part of the women above 25 years of age have no work outside their home, and consequently have not reported diseases of shorter duration. This allows the conclusion that women have more sick reports than shown in the material. The National Health Service of Denmark has provided a diagram showing the general pattern of morbidity in Denmark according to sex and age, as well as the proportion of people who have seen a doctor, so that it is possible to get an estimation of the number of missing cases.

Considering the duration of the periods of sickness, men have 10.8 per cent periods of more than 60 days, against 15.0 per cent for women. But the above-mentioned missing reports amongst women are bound to be among the short periods, and they will easily bring the percentage for women down to about 10. This means that the present material does not give any indication of any difference in duration of sick-reports among the sexes.

People with fixed salary are generally claimed to have more numerous and longer sick periods than people paid per hour, or who have their own business. It has been impossible to assess the relative number of those categories in the clientele as a whole, and consequently the report is confined to the duration of the sick-leaves. It is shown that people with fixed salary have shorter periods than others, even considering the above-mentioned missing reports among women. But it may be of some importance that in some cases people on fixed salary have to produce a certificate for shorter periods, where people paid per hour probably would not report.

If the material is split up in two age-groups, below and above the age of 35, a marked tendency to disease of longer duration is found above the age of 35, with some tendency according to sex. (Male: 13 per cent; female: 18 per cent).

People whose husband or wife have paid work have been sorted out, to see whether the fact that the economy of the family remains on a fair level during disease has a tendency to create longer sick periods. No such tendency is found.

It is impossible to assess how big a proportion of the clientele as a whole live in condemnable dwellings (damp and/or dark, overcrowded, basements or garrets). But of 1544 persons with a sick report, 159 are living in bad dwellings. These 10 per cent of all persons reported ill stand for 16 per cent of all sick reports (295 of 1833), which means 1.89 sick-reports per person against 1.10 in the remaining material. The sick periods from bad dwellings show nearly exactly the same duration as the material as a whole. There are a number of explanations to this fact: recent tuberculosis is virtually out of the question, rheumatic fever is too rare to be of statistical interest, treatment with antibiotics shortens a number of diseases which otherwise might have a relatively longer duration in bad dwellings, and finally, the real chronic diseased get an invalid allowance, but no sick-report. It is worth a social study to see whether the slum clientele capitulates more easily to disease and other adverse conditions than do other persons. The distribution of diagnoses is, apart from a small overweight in pregnancy and neurosis, nearly the same in the bad dwellings as in the material as a whole.

The total clientele of 12,189 persons were sorted out in the different quarters of the town of Odense. The ratio sick-report: clientele is 11—13 per cent in the modern quarters, about 20 per cent in the old.

The most numerous group of diseases is infections in the respiratory tract, and though the course in usually very short, it is worth mentioning that this group is number two in loss of

working days. Number two in frequency is diseases in bones, joints, and muscles (apart from acute rheumatic fever). This group which comprises the rheumatic cases represents the biggest loss in working days. Psychosis and neurosis, though comparatively not numerous, take a relatively heavy toll in working days, neurosis being the more numerous of the two. Accidents represent 13 per cent of the total estimated loss of working days.

The charts also show the result of an inquiry into neurotic disorders. There were 312 formerly recognized cases of neurotic disease in 243 persons, and 16 cases were recognized during the actual disease. In the material of 1833 sick-reports, 235 or 12.8 per cent had a sick period of more than 60 days. In the total material there were 328 neurotics. Of them 75 or 22.9 per cent had a sick period of more than 60 days.

Reference:
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THE INCIDENCE OF PULMONARY TUBERCULOSIS IN DENMARK BY SEX AND AGE 1921—1955

By ERIK IVERSEN

INTRODUCTION

Between 1921 and 1955 pulmonary tuberculosis mortality in Denmark decreased from 72 to 5 per 100,000 population, or by 93 per cent. During the same period the morbidity[1]) from this disease fell by 83 per cent, from 163 to 28 per 100,000. Apart from this difference in steepness of decline, the morbidity and mortality rates — for both sexes and all ages combined — have shown remarkably similar trends during the past 35 years: both rates decreased fairly rapidly during the twenties and thirties, increased — or showed only a slight decrease — from 1940 to 1946 and thereafter dropped more rapidly than ever before. Also when the rates are broken down by type of district — urban and rural — and according to geographical region, similar patterns are found for the morbidity and the mortality. This parellelism has been described in detail by Horwitz & Iversen (1).

The present paper analyses the relation of pulmonary tuberculosis morbidity and mortality to sex and age; it is found that a parallelism such as observed between the crude morbidity and mortality rates also by and large exists for the sex and age specific rates. The analysis is based upon detailed tabulations prepared by the National Health Service from individual medical notifications of cases of pulmonary tuberculosis and from death certificates (1).

TIME-TRENDS 1921—1955 BY SEX

Whole Denmark.

The trends of the morbidity and mortality rates during the period 1921—1955 are shown in Fig. 1, separately for males and females. All four curves largely follow the trend for both sexes combined, described in the introduction. The rates, however, show a more rapid decrease for females than for males, the morbidity rates up to 1940 and the mortality rates up to 1945. Since then the rates for the two sexes have moved almost parallel.

The rates for females exceeded those for males during the twenties and thirties. Around 1940 the curves for the two sexes intersect, after which the rates have been higher for males than for females, although as far as morbidity is concerned the difference has been very small (Lindhardt (2)).

Capital, provincial towns, rural districts.

Curves corresponding to those given in Fig. 1 for the whole of Denmark are shown in Fig. 2 for each of the three types of district: capital[2]), provincial towns and rural districts. These curves, too, show a similarity in pattern between morbidity and mortality. The sex pattern, however, differs with type of district. In Copenhagen the curves for males and females run more or less parallel, the rates for males being throughout somewhat higher than those for females. In the provincial towns and rural districts, on the other hand, the rates for females decrease more rapidly than those for males. In the provincial towns females experienced higher rates until about 1940 and thereafter lower rates than males. In the rural districts the rates for females exceeded those

[1]) Morbidity as defined in this paper is the number of new cases per 100,000 population.

[2]) The morbidity rates refer to Copenhagen municipality (population: 765,000 in 1950) while the mortality rates relate to Copenhagen and Frederiksberg municipalities combined (population: 885,000).

From the Danish Tuberculosis Index.
Chief: *E. Groth-Petersen.*

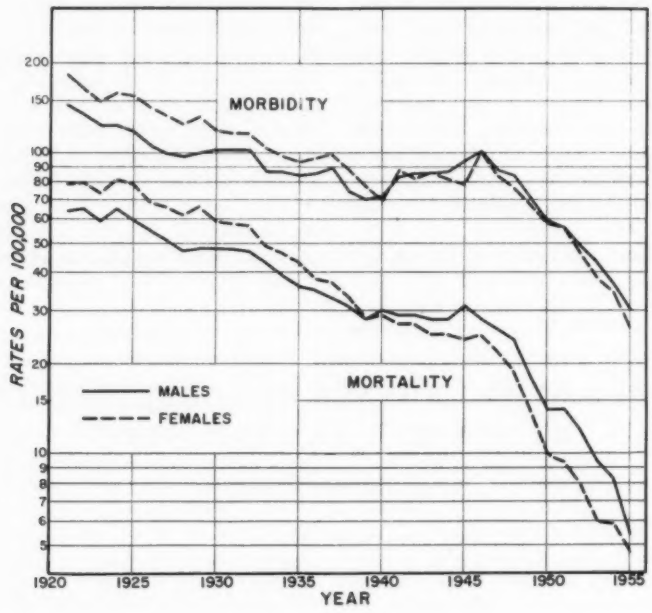

Fig. 1.
Morbidity and mortality from pulmonary tuberculosis, by sex. Denmark 1921—55.

for males until about 1945, after which the rates for the two sexes have been almost identical.

AGE-PATTERN AT SELECTED PERIODS OF TIME, BY SEX

Whole Denmark.

The age-pattern of pulmonary tuberculosis morbidity and mortality appears from Fig. 3. The upper two sections show age-specific morbidity rates for males and females and the lower two sections the corresponding age-specific mortality rates; curves are given for every fifth year[3]) between 1925 (morbidity 1935) and 1955.

The morbidity curves for 1950 and previous years are remarkably similar: the rates are low in childhood, increase rapidly during adolescence to reach a maximum in young adulthood (in most cases at ages 20—24 years) and then decline again, though usually less rapidly; after the age of 50 the rates remain almost constant. Between 1950 and 1955 a remarkable change takes place: the morbidity peak in young adulthood becomes much lower for females and almost disappears for males.

While the morbidity curves have thus retained the same pattern until very recently, the mortality curves have changed gradually since 1930. In 1925 and 1930 the mortality curves showed the same shape as the morbidity curves for 1935—50, apart from a less prominent peak in young adulthood. In the following years the mortality peak gradually becomes lower and lower and at the same time shifts to higher ages: from 20—24 years for both sexes — in 1925 and 1930 — to 30—34 years for males and 35—44 years for females in 1955. The peak is, however, hardly discernible in the curves for 1955 which reflect an almost steady increase in the rates with age.

The curves in each of the four sections of Fig. 3 are in general regularly arranged; the curve for the earliet period runs at the highest level, the levels becoming progressively lower and lower with each succeeding period. Thus, the rates in most age-groups have declined more or less steadily with time. (Owing to the increase in rates during the early forties the curves for 1945 do not fit into the regular picture; they are often higher than the 1940-curves, the morbidity curve for males being higher even than in 1935.) The change in shape of the curves shows, however, that the rates for the different age-groups did not decline at the same pace. This is clearly brought out by Table 1 which gives the annual percentage decrease (or increase) of the rates for the age-groups 20—24 years (young adulthood) and 45—54 years (middle age); data are given separately for the four periods 1935—40, 1940—45, 1945—50 and 1950—55.

During 1935—40 the morbidity rates for the four age-sex groups went down by 3—6 per cent

[3]) To avoid excessive random variations the curves labelled 1925, 1930 .... 1950 have been based on average rates for the three-year periods 1924—26, 1929—31 .... 1949—51, respectively.

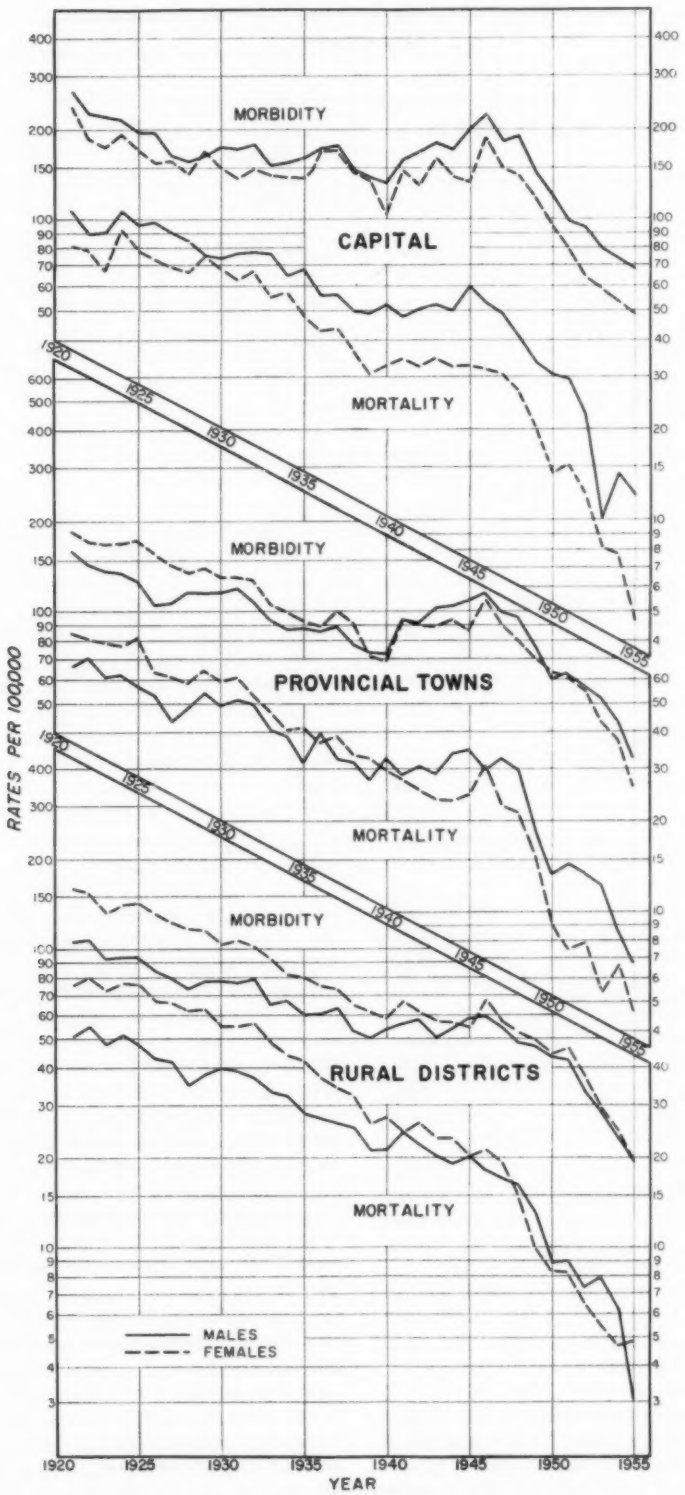

Fig. 2.

Morbidity and mortality from pulmonary tuberculosis, by sex. Capital, provincial towns and rural districts 1921—55.

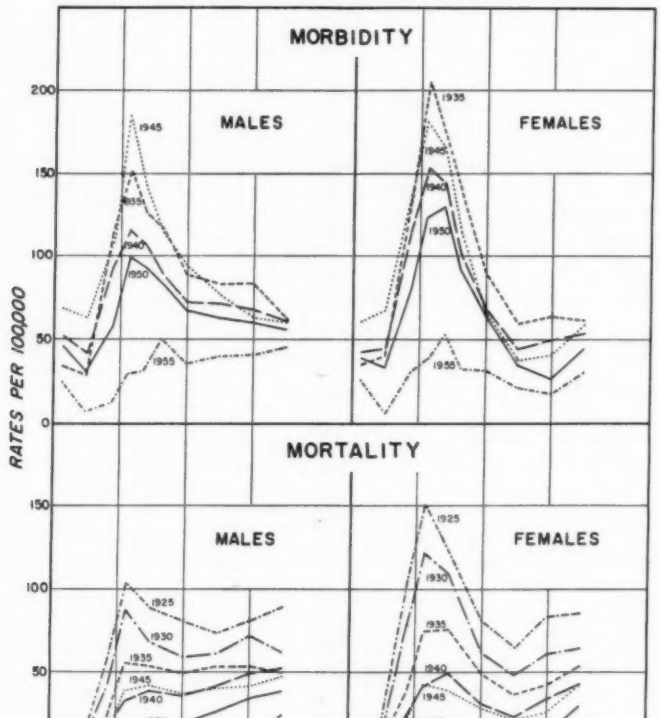

Fig. 3.
Morbidity and mortality from pulmonary tuberculosis, by age and sex, for selected periods of time. Denmark.

Table 1.
Average annual changes) in pulmonary tuberculosis morbidity and mortality in selected periods between 1935 and 1955. Age-groups 20—24 and 45—54 years and all ages, by sex.*

Period	20-24 years		45-54 years		All ages	
	males	females	males	females	males	females
	per cent	per cent	per cent	per cent	per cent	per cent
Morbidity						
1935—40	— 5	— 6	— 3	— 6	— 3	— 4
1940—45	+10	+ 3	+ 1	— 2	+ 5	+ 2
1945—50	—12	— 7	— 4	— 3	— 8	— 7
1950—55	—21	—21	— 9	—10	—14	—15
Mortality						
1935—40	—11	—11	— 6	— 9	— 5	— 8
1940—45	+ 4	0	0	— 1	0	— 2
1945—50	—25	—24	— 9	—12	—12	—15
1950—55	—36	—29	—22	—18	—17	—15

*) +: increase; —: decrease.

annually and the mortality rates by 6—11 per cent. During the war young adult males experienced an increase in both morbidity and mortality, the former amounting to 10 per cent and the latter to 4 per cent per annum; the rates for the other groups changed but little. In the first 5 years after the war the morbidity rates dropped by 3—12 per cent annually and the mortality rates by 9—25 per cent, while during the second 5-year period the annual decrease in rates amounted to as much as 9—21 per cent for morbidity and 18—36 per cent for mortality. Thus, the morbidity rates throughout decreased less rapidly or increased more rapidly than the mortality rates. Common to morbidity and mortality is that the rates for young adults changed much more than those for older people; the post-war reduction in the rates was 1½—3 times larger among the former than among the latter.

Comparison of the figures for males and females in Table 1 shows no systematic difference; this seems to be inconsistent with the more rapid decline of the curves for females in Fig. 1. Before this point is further discussed the age-pattern of the morbidity and mortality for the two sexes will be analysed more closely. In Fig. 4 the morbidity and mortality curves for 1935 and 1955 (previously shown in Fig. 3) have been arranged so that the corresponding age-specific rates for the two sexes can be easily compared. It appears that in 1935 the morbidity and mortality rates for young children showed almost no sex differ-

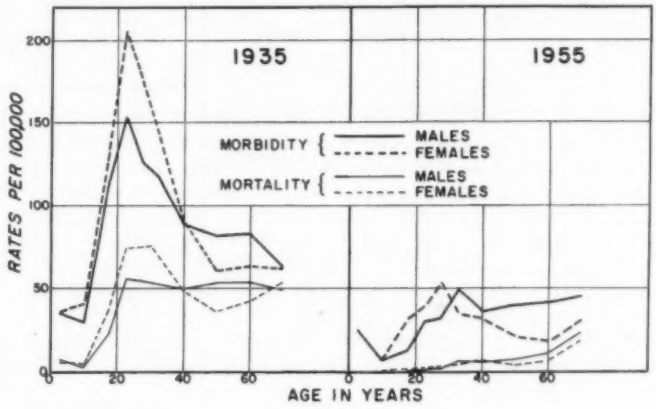

Fig. 4.
Morbidity and mortality from pulmonary tuberculosis, by age and sex. Denmark 1935 and 1955.

ential. Among adolescents and young adults, however, the rates for females considerably exceeded those for males. Around the age of 40 years the curves intersect and above this age morbidity and mortality is higher among males than among females. The same pattern is seen in 1955, except that the morbidity curves cross each other at age 30 and that the mortality rates for males and females are very nearly the same at ages under 40; at ages under 20 the mortality was practically nil in 1955.

The fact that — as shown in Fig. 1 — the rates for females decrease more rapidly than the rates for males can thus, at least partly, be explained in the following way. In the early years a large proportion of the total number of deaths and cases, which form the basis of the crude rates shown in Fig. 1, occurred in the younger age-groups where the mortality and morbidity rates were higher for females than for males; consequently the crude rates were also higher for females than for males. With the passage of time, however, the rates for the young age-groups have decreased more rapidly than those for the old age-groups. As a result an increasing proportion of the number of deaths and cases is concentrated in the oldest age-groups where mortality and morbidity rates are higher for males than for females; the crude rates for recent years are therefore also higher for males than for females.

Capital, provincial towns, rural districts.

Fig. 5 shows the age-sex pattern of the morbidity and mortality rates for 1950, separately for the capital, the provincial towns and the rural districts.

The level of the rates is in general highest for the capital and lowest for the rural districts, but the sex-age pattern is in all three types of districts largely similar to that for the whole country shown in Fig. 4. The excess of male rates over female rates in the older age-groups is particularly striking for the capital; this is the reason why the crude rates for males in the capital are considerably higher than those for females, cf. Fig. 2. In the rural areas the excess of male rates over female rates at higher ages is nearly counterbalanced by the excess of morbidity and mortality among young females, the crude rates being almost the same for the two sexes. The curves for the provincial towns take up an intermediate position between the curves for the capital and the rural districts.

Corresponding curves for earlier years (not given in this paper) show for the capital the same marked excess of male rates over female rates in the older age-groups as in 1950: the crude rates for these years were therefore also higher for males than for females, cf. Fig. 2. In the provincial towns and especially in the rural districts, however, it was the excess of female rates over male rates in the younger ages which predominated; accordingly, the crude rates here were higher for females than for males.

RATIO OF NEW CASES TO DEATHS

The ratio of the number of new cases of pulmonary tuberculosis to the number of deaths from this disease is given in Table 2 for 1935 and 1955, by sex and age. In 1935 there were 5—6 new cases per death in the youngest age-group (0—4 years); at ages 5—14 years the ratio was 12 to 1 for males and 9 to 1 for females. The ratio then decreased with age; among persons over 35 years there were only 1—2 new cases per death. In 1955 only 3 persons under 20 years died from pulmonary tuberculosis; reliable ratios therefore cannot be calculated for these ages. At ages over 20 years the ratio of new cases to deaths is considerably higher than in 1935. For males the ratio ranges from 43 (age-group 20—24 years) to 1.9 (65 years or more), for females from 19 to 1.7.

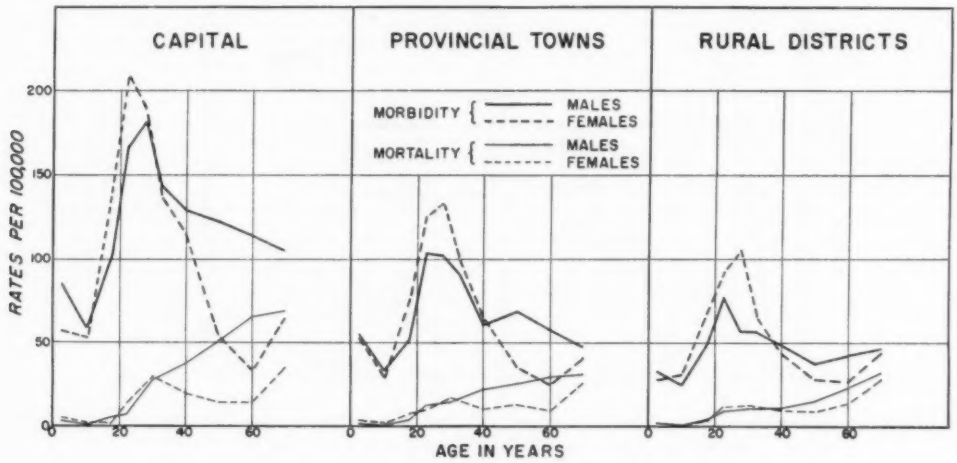

Fig. 5.
Morbidity and mortality from pulmonary tuberculosis, by age and sex. Capital, provincial towns and rural districts 1950.

Table 2.
Number of new cases per each death from pulmonary tuberculosis, 1935 and 1955, by sex and age.

Age in years	1935		1955	
	males	females	males	females
0— 4	5.0	6.2	—*)	—*)
5—14	12.1	8.9	—*)	—*)
15—19	5.0	3.6	—*)	—*)
20—24	2.7	2.8	42.9	18.6
25—34	2.3	2.1	10.3	12.1
35—44	1.8	1.9	6.2	4.5
45—54	1.5	1.7	6.1	5.5
55—64	1.6	1.5	3.7	1.7
65—	1.3	1.1	1.9	1.7
All ages ..	2.3	2.3	5.4	5.5

*) Not calculated because of no or too few deaths.

SUMMARY AND CONCLUSIONS

Morbidity and mortality from pulmonary tuberculosis in Denmark earlier varied markedly with age: the rates were low in childhood, extremely high in young adulthood and moderate in old age. Rates for the two sexes are almost identical in childhood; in adolescence and young adulthood the rates are higher for females than for males; in old age the rates for males exceed those for females. The decrease in the rates with time has been more rapid in the young age-groups than in the old age-groups; crude rates by sex for earlier years therefore reflect the excess of morbidity and mortality among young females while the crude rates for recent years reflect the excess of male rates over female rates among the elderly.

Although the incidence of pulmonary tuberculosis varies markedly with sex, age, calendar time and type of district, the morbidity and mortality rates follow remarkably similar patterns. The decrease with time has, however, been more pronounced for mortality than for morbidity rates.

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DERMATOMYOSITIS AND TUMOR

By ROBERT JORDAL

Since the disease dermatomyositis was first described in 1863 by Wagner (13), approximately 600 cases have been published, and several reviews are available by now. (3, 8, 10).

The disease is characterized pathologic-anatomically by a non-suppurative inflammation of the muscles and a dermatitis with a rather severe edema. Creatinuria and abnormal electromyogram

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(Head: *Torben Andersen*).

are frequent findings in the disease and are presumably due to abnormally proceeding metabolic processes in the tissues.

The creatinuria has been described in 1931, and the demonstration of this anomaly provides a valuable diagnostic aid. However, creatinuria need not be pathological and is not specific of dermatomyositis. Normal values are: adult males: — creatinuria. Females, children, and eunuchs: < 400 mg/24-hours. To assess the diagnostic value of a creatinuria the following coefficient of creatinine has been employed: mg. creatinine in the urine per kilo bodyweight in twenty-four hours. Normals are: 18—32, while in patients suffering from dermatomyositis it declines far below 18, indicating that creatine is being excreted instead of creatinine.

Our knowledge of the disease at the present time is, however, strictly limited, especially with regard to etiology and pathogenesis, but its many points of similarity with diseases such as disseminated lupus erythematosus, diffuse scleroderma, periarteritis nodosa have made it natural to class them under the common heading: generalized connective tissue disorders.

Major theories with regard to etiology are:

1. The theory of infection, according to which the causative agent should be some unknown virus or organism; some, however, contend that from injured muscles they have been capable of culturing streptococcal organisms, which when inoculated into mice have in some cases produced hemorrhagic muscle lesions. The administration of antibiotics has resulted in an improvement or recovery in some cases. In some instances there has been relation in time between the onset of an infection (often tuberculosis) and the development of a dermatomyositis.

2. The theory of an allergic genesis rests mainly on the fact that in some instances there has been an exacerbation of symptoms directly resulting from exposure to some specific allergen.

3. A certain insufficiently elucidated relation between the metabolic processes of the muscles and vitamin E is responsible for a theory of avitaminosis, and by increased vitamin E intake it has been possible to reduce the creatinuria, still without obtaining any clinical improvement.

4. The simultaneous appearance of endocrine disorders (1) has given rise to a theory of hormonal dysfunction as the cause of dermatomyositis, but conclusive evidence is still lacking.

5. A significant, but hitherto missed observation, throwing fresh light on the etiology of the disease, is that a tumor, frequently malignant in nature, is often met with in patients suffering from dermatomyositis. This phenomenon has presumably been first described by Sterz (11) in 1916, but Bezecny was the first to suggest an interrelationship, when in 1935 (2) he published 2 cases of which one was suffering from mammary cancer, the other from a carcinoma of the ovary. Since then similar cases have been published, and by Danish investigators for the first time in 1943 by Bohse and Benjamin-son (3), who at an autopsy of a female who had for seven months been suffering from a typical dermatomyositis, demonstrated a carcinoma of the gall bladder. In 1944 Haxthausen (7) demonstrated to the Danish Dermatological Society a female who had been surgically treated for an ovarian cancer 18 months previous to the appearence of a dermatomyositis. In 1949 Sunde (12) published a case of dermatomyositis in an 11-year-old girl, who later on appeared to be suffering from a chromophobic adenoma of the pituitary.

Presumably about 60 cases have been reported with a relation between dermatomyositis and neoplastic disease, of which by far the greater number have been malignant. They have been widely ranging in structure and site. According to Domzalski and Morgan (4) the following organs are involved and named after order of frequency: the ovaries, breasts, reticulo-endothelial system, stomach, gall bladder, cervix uteri, rectum, oesophagus, lung, kidney, pituitary, parotis, bones, and the retroperitoneal tissue. The numerous reports published rule out the possibility of a coincidence. Confirmative evidence is also the observation that the dermatomyositis has been known to disappear following surgical or radiation therapy of the tumor, but in case of late metastases there has been a relapse.

CASE HISTORY

At the Medical Department of the Frederiksborg Central County Hospital it has been possible for us to follow a case:

The patient was a hair-dresser aged 46, who had for several years been suffering from psoriasis. About one year before his admission to the hospital he noticed that his arms were not as strong as they used to be. He paid no attention as he felt completely well. Six months later he developed from unknown cause — especially exposure to strong light was out of the question — a hollyhock coloured erythema across the bridge of the nose and around the eyes, accompanied by a severe periorbital edema, and in the course of a few days the affection spread to the whole of the face and to the extremities. In the course of another two months there was a marked edematous swelling and powerlessness of both arms and later on of the legs too. The patient was then transferred to the department, where an examination showed increased consistency of the musculature of forearms and shoulder region. Skin biopsy from the forearm revealed epithelic thickening, edema and chronic inflammation. Muscle biopsy from the forearm revealed nothing abnormal, and a neurological examination revealed normal conditions.

On admission to the Frederiksborg Central County Hospital one month later the patient's condition was as follows. He was confined to bed all the time, was not able to turn round in his bed, was not able to swallow solid food and had a constant elevated tem-

perature of 100.4° F (38° C). The skin showed characteristic changes with a hollyhock coloured erythema around the eyes and on the nose, and there was a moderate periorbital edema. On the hands, particularly around the nails and on the knuckles, there were hard excrescenses, about the size of the head of a pin; in some places they had merged to form plaques. On the breast there was a curious netlike hyperpigmentation. The musculature presented no abnormal feature apart from a massive diffuse paresis of all groups of musculature. There was no manifestation of neurological disorders.

Laboratory findings were as follows:

Serum protein: 5.04 per cent.

Albumin + Alpha$_1$-Globulin ..	50.9 per cent.
Alpha$_2$-Globulin	24.9 per cent.
Beta-Globulin	12.5 per cent.
Gamma-Globulin	11.7 per cent.

Urine:

Creatine: 564 mg/24 hrs.
17-ketosteroids: 2.4 mg/hrs.
Corticoids: 0.45 mg/24 hrs.

X-ray of the thorax: nothing abnormal.

Electromyography: The right biceps brachii: Interference with maximal contraction (still but slight potential amplitude, so that the pattern of potential amplitude is not directly comparable to that of normal musculature), increased mechanical irritability reflected in insertion potentials. Besides there are a few spontaneous discharges in spite of complete muscular relaxation. No synchronization. Some polyphasal potentials. Conclusion: No manifestation of neurological disorder. Potential duration extremly shortened, which I have so far only met with in polymyositis. (sign. F. Buchtal).

Muscle biopsy: There are marked changes in the interstitial connective tissue, which is edematous and hypertrophic in some areas, and moreover diffusely infiltrated with histiocytes, lymphocytes, a few plasma cells and some polynuclear leucocytes. This infiltrate is the strongest around the vessels, whereas the walls are not affected. When there is a strong infiltration of cells and moreover some hypertrophy of the interstitial connective tissue there is varying atrophy of the muscle fibres of the same muscle bundle and the nuclei of many such fibres are centrally displaced. Granulation tissue invades these fibres in some areas, and here the cross and longitudinal striation is partly effaced. In the adjacent fatty tissue bleedings from the surgical procedure are seen, but there is no infiltration of cells. Histologic diagnosis: Sub-chronical myositis with secondary dystrophy of muscles. (sign. Erna Christensen).

Treatment with ACTH (Acton prolongatum) was now instituted in doses of 10 units daily, but as after 12 days of treatment no improvement set in with regard to powerlessness or return to normal of the temperature, a determination of the hormonal production of the adrenal cortex was made with the following result: 17-ketosteroids 3.7 mg/24 hrs., corticoids: 0.54 mg/24 hrs. As the possibility could not be ruled out that a primary adreno-cortical insufficiency was involved, an intravenous infusion of 20 units ACTH (Acton) during eight hours was administered. By this treatment the production of 17-ketosteroids and corticoids rose to 6.1 and 2.04 mg/24 hrs. respectively, and the patient now had less difficulty in swallowing and the elevated temperature returned to normal. The failure of effect of intramuscular ACTH therapy must presumably be ascribed to increased destruction of ACTH in the lesioned muscles.

Treatment with cortisone in doses of 200 mg daily was now commenced, which brought about a rapid improvement of the pareses of the patient, his difficulty in swallowing entirely disappeared and he became able to walk about by two sticks. There was no material change in the skin disorder. In Fig. 1 are shown the variations in the creatinuria. On a maintenance dose of 75 mg of cortisone daily the patient developed severe edemata after his discharge from the hospital. The etiology of such edema might be a progression of the disease or a salt retention caused by cortisone. On a diet poor in salt and with unaltered dosage the edemata disappeared. The patient gradually improved until three months after institution of treatment. By this time his difficulty in swallowing and his periorbital edema returned and a slight swelling on the front of the patient's chest appeared. X-ray of the lungs revealed a tumor-suggestive shadow arising from the mediastinum. Aspiration biopsy seemed to justify the diagnosis of lymphosarcoma. Intensive radiation therapy was now instituted, the dose of cortisone increased and supplemented with Prednisone without obtaining any improvement. The patient now requested to be discharged from hospital and he died at home about ten months from the time when the disease became manifest.

Epicrisis: A 46-year-old man developed a typical dermatomyositis which responded to Cortisone therapy for some months, but concurrently with the appearance of a malignant mediastinal tumor (lymphosarcoma?) there was recurrence of symptoms and in spite of radiation therapy and increased doses of Cortisone the case terminated fatally.

DISCUSSION

The history of the disease serves to illustrate several interesting features in dermatomyositis.

1) The interrelationship between tumor and dermatomyositis makes it desirable that any patient suffering from this disease should be carefully examined with a view to malignant tumors.

2) The negative findings by muscle biopsy in the initial stage of the disease are not infrequent and by no means rule out the possibility of a diagnosis of dermatomyositis.

3) A treatment with adrenocortical hormones is not capable of effecting a cure in this disease either, the striking effect in the early stages of treatment being due to the ability of these drugs to alleviate the symptoms of connective tissue diseases, the development of which, however, is not capable of being arrested.

In this connection it may be of interest to mention some investigations which likewise throw light on these mysterious diseases. Lansbury (9) has published a series of cases indicating a relationship between the occurrence

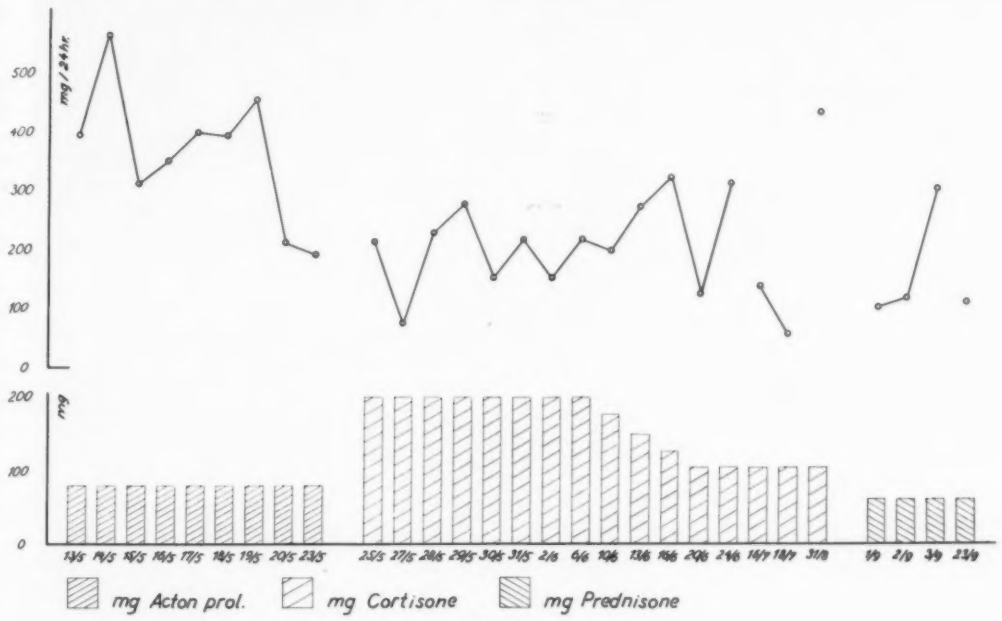

Fig. 1.
The creatine excretion during the treatment.
The doses of Acton prol. and prednisone are expressed as the quantity of cortisone with which they are equivalent.

of malignant tumors and most connective tissue diseases. J. L. Hansen (6) has described an interrelationship between cancer of the lungs and a joint disorder which may manifest itself clinically as a typical rheumatoid arthritis, vanishing on radical operation of the lung cancer.

A hitherto unrecognized similarity between certain cases of collagen diseases has been demonstrated by Eaton (5), who at the Mayo Clinic collected an extensive material of myositis patients and found uniform histologic and electromyographic changes in 1) patients with dermatomyositis, 2) certain cases of rheumatoid arthritis, 3) patients with scleroderma, and 4) patients with non-specific myositis characterized by relatively rapidly evolving symmetrical powerlessness of the proximal muscle groups of the extremities. According to Eaton, the common denominator of all these diseases is the myositis. If this be complicated with other visceral manifestations, the various clinical pictures will appear. According to this theory he conceives disseminated lupus erythematosus to be a myositis associated with marked symptoms from the serosae and so on.

On the basis of these experiences it would seem tempting to consider connective tissue diseases as being a pathological reaction to some noxa (tumor, trauma, infection, etc.). According to the predominant manner of reaction of the connective tissue and the organ most heavily effected, the well-known clinical pictures will appear. These diseases may on further investigation prove to have in common more features than at present imagined.

SUMMARY

The interrelationship between tumor and dermatomyositis is described and a case of dermatomyositis and lymphosarcoma is reported. An attempted therapy with Cortisone brought a spectacular relief of symptoms, but the effect was only temporary.

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ANNOTATION

ACTOCORTIN

A WATER-SOLUBLE CORTICOID IN THE TREATMENT OF SHOCK

By EMIL VERMEHREN, MARTIN VERMEHREN, T. WEIBÜLL, J. LYNG and M. O. UNGER

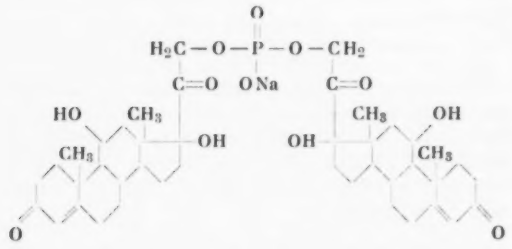
During the last 7 years there has been increasing interest in corticoid treatment of shock caused by infection.

However, there have been certain technical drawbacks in Hydrocortisone treatment, because of the difficult solubility of Hydrocortisone in water. For this reason it has been necessary previously to add Hydrocortisone dissolved in water-alcohol to the infusion liquid.

Therefore, it was considerable progress when it was found possible to prepare a compound of Hydrocortisone and succinic acid which was easily soluble in water so that it is sufficient to inject a few millilitres.

Investigations made by M i l l s and T h o m a s have proved the importance of Cortisone for the transport of phosphate from the blood into the tissue fluid. This and similar ideas led us to the manufacture of a water-soluble corticoid containing phosphate, to which we have given the name "Actocortin".

Actocortin is [di-(17-hydroxycorticosterone-21-)]-phosphoricacidester-sodiumsalt. The formula of Actocortin is:



Given intravenously and intramuscularly Actocortin has a very rapid universal effect.

We have treated 9 patients suffering from acute abdomen with this preparation, giving 3 × 100 mg during the first days, then 2 × 100 mg, and finally 1 × 100 mg daily, during a maximum of 6 days. The treatment was finished with Corticotropin (Acton Prolongatum), 20 i. u. daily for a few days before and after the withdrawal of Actocortin; at the same time the patients were treated with antibiotics.

Of the 9 patients 7 were in a state of shock. In 6 of these 7 patients its was noted approximately one hour after the first injection of Actocortin that the patient was a little better, while approximately 6 hours after the Actocortin injection was given, a pronounced increase in the blood pressure was found in each case. However, the blood pressure was normal 12—24 hours after the treatment was started.

In one patient we did not dare to await the effect of the Actocortin, but gave Arterenol with a good result. As regards the 2 patients who were not in a state of shock, Actocortin was given prophylactically, as their state would presumably pass into shock. These cases were remarkably uncomplicated, which was proved, for instance, by a rapidly re-established fluid balance.

Like K i n s e l l we are therefore of the opinion that much easier and better results are obtained if Actocortin is given prophylactically.

Contrary to K i n s e l l, who postponed operation till the shock was over, we have considered it right to remove the cause of shock as soon as possible so that the patients were always operated on immediately. This procedure, in conjunction with Actocortin treatment, has proved suitable for the patients in question, as none of these died. However, it must be pointed out that the number of patients is very limited.

When re-operating in a single case, the peritoneum was found bright and shining, which K i n s e l l has also observed. There is consequently a possibility that the treatment with Hydrocortisone may prevent or reduce the frequency of adhesions.

Like K i n s e l l we have been unable to observe disadvantages in the treatment (insufficient healing of wounds and spread of infection).

Absolute indications for Actocortin treatment are:

1. Shock.
2. Severe infections, as, for instance, peritonitis and septicaemia.
3. Paralytic ileus.
4. Preceding treatment with Corticoids.

Relative indications are the generally known shock-disposing conditions.

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